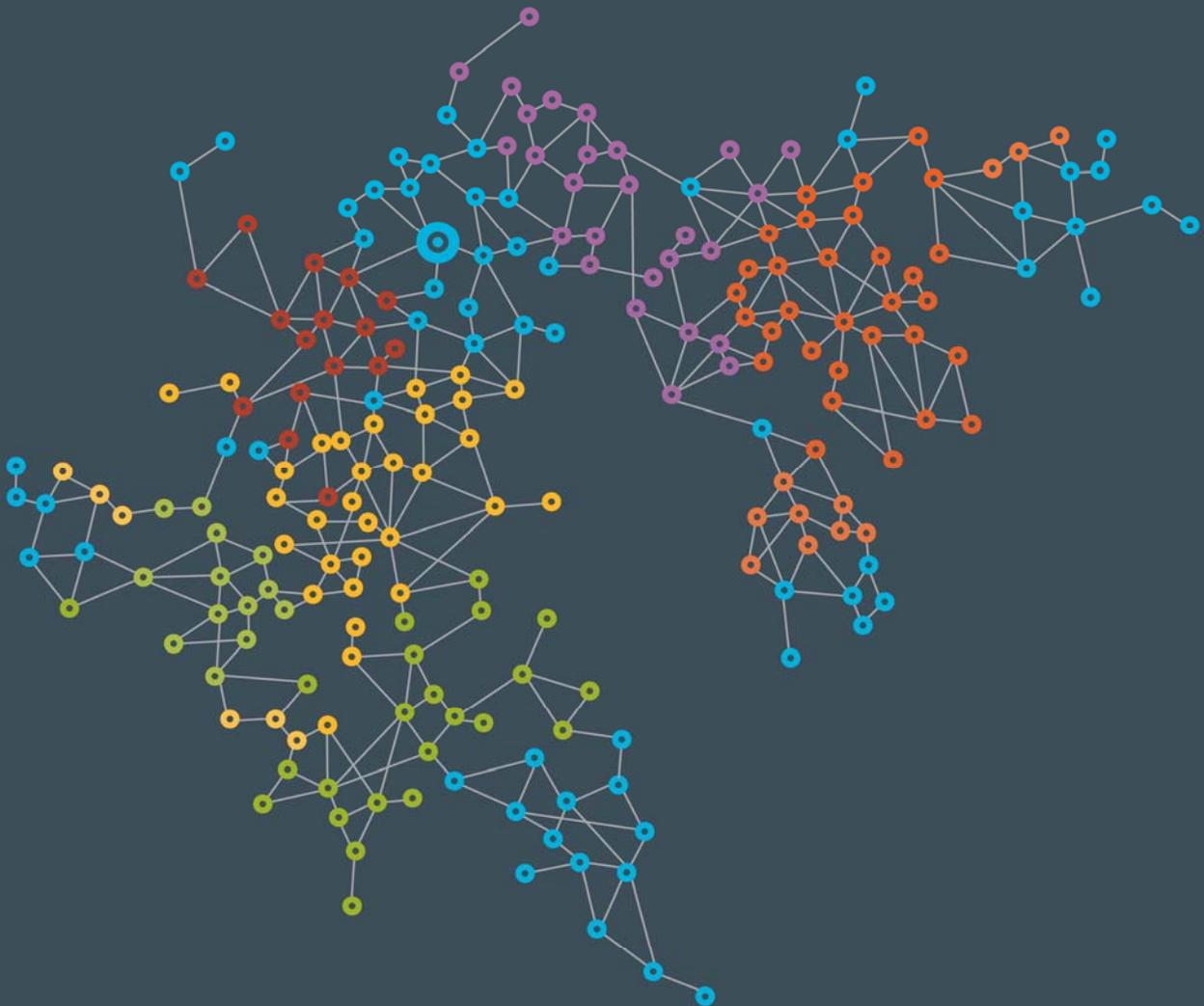




INDEPENDENT
MARKET
OPERATOR

Final Report: Maximum Reserve Capacity Price for the 2015/16 Capacity Year

January 2013



DISCLAIMER

The Independent Market Operator (IMO) has prepared this report under section 4.16 of the Wholesale Electricity Market Rules (Market Rules) to describe the process it followed in arriving at a proposed revised value for the Maximum Reserve Capacity Price.

Although all due care has been taken in preparing this report, the IMO makes no guarantee that it is completely accurate and accepts no liability for any errors.

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EXECUTIVE SUMMARY

Each year, the Independent Market Operator (IMO) is required to determine the Maximum Reserve Capacity Price in accordance with the *Market Procedure: Maximum Reserve Capacity Price*¹ (“Market Procedure”).

The Maximum Reserve Capacity Price (MRCP) sets the maximum bid price that can be made in a Reserve Capacity Auction and is also used as the basis to determine an administered Reserve Capacity Price if no auction is required.

The MRCP aims to establish the marginal cost entry of providing additional Reserve Capacity in each Capacity Year. The MRCP is established by undertaking a technical bottom-up cost evaluation of the entry of a 160 MW Open Cycle Gas Turbine (OCGT) generation facility entering the Wholesale Electricity Market (WEM) in the relevant Capacity Year.

This Final Report details the outcome of the determination of the MRCP for the 2013 Reserve Capacity Cycle. The value used for the 2013 Reserve Capacity Cycle will be effective from 1 October 2015 through to 1 October 2016.

The methodology for determining the MRCP is specified in the Market Procedure and includes a technical costing of the following components:

- the capital cost of a 160 MW OCGT power station with inlet cooling, located within the South West interconnected system (SWIS);
- the land cost associated with developing and constructing the power station;
- the cost associated with connection of the power station to the transmission system;
- the cost associated with building liquid fuel storage and handling facilities for the power station to accommodate 24 hours of operation;
- the fixed Operational and Maintenance (O&M) costs associated with the power station and the transmission facilities listed above;
- a margin for legal, approval, financing and insurance costs and contingencies; and
- the Weighted Average Cost of Capital (WACC).

The methodology (valuing the cost of entry of a 160 MW OCGT power station) employed this year for determining the MRCP is identical to that used last year.

MRCP outcome

The 2013 Maximum Reserve Capacity Price proposed by the IMO in this Final Report is \$157,000 per MW per year. This is 4.2% lower than the MRCP of \$163,900 determined for the 2012 Reserve Capacity Cycle.

¹ The Market Procedure is available at <http://www.imowa.com.au/market-procedures>

The final MRCP has been determined using a WACC with a franking credit value, or gamma, of 0.25. The change in the gamma from 0.5 to 0.25 is facilitated by the approval and commencement of Procedure Change Proposal PC_2012_08².

Changes since 2014/15 MRCP

Table A shows the impact of changes in the input parameters since the 2014/15 MRCP.

Table A: Impact of changes in input parameters

	Impact (\$)	Impact (%)	MRCP (\$)
2014/15 MRCP			163,900
Escalation factors	+ 400	+ 0.2%	164,300
Power Station costs	- 4,300	- 2.6%	160,000
Margin M	+ 600	+ 0.4%	160,600
Fixed Fuel Cost	+ 2,800	+ 1.7%	163,400
Land Cost	- 100	- 0.1%	163,300
Transmission Cost	+ 600	+ 0.4%	163,900
WACC	- 7,700	- 4.7%	156,200
Fixed O&M	+ 800	+ 0.5%	157,000
Combined impact	- 6,900	- 4.2%	157,000

The most significant changes since the 2014/15 MRCP are explained below.

- The Power Station Cost is 3.4% lower than for 2014/15, with the reduction driven by falling steel and copper prices coupled with the appreciation of the Australian dollar versus the Euro.
- The Fixed Fuel Cost is 122% higher than last year. Sinclair Knight Merz (SKM) has reviewed this estimate for the first time, based on the same scope as previous estimates provided by GHD. SKM has developed its estimate with the benefit of recent project experience in Western Australia.
- The WACC has reduced from 6.83% to 5.95%. This has been driven by a further deterioration in bond yields in the past year and the use, for the first time, of the “Bond-Yield Approach” developed by the Economic Regulation Authority (ERA) for determining the debt risk premium.

² See http://www.imowa.com.au/PC_2012_08

Stakeholder workshop held on 1 November 2012

In submissions on the 2014/15 MRCP, a number of stakeholders suggested that the capital structure assumptions that underpin the WACC calculation may not be appropriate for the current composition of the WEM. In particular, these stakeholders suggested that it was likely that a generator in the WEM would raise debt finance from a bank rather than through the corporate bond market. The IMO committed to review these assumptions in 2012.

The IMO commissioned PricewaterhouseCoopers (PwC) to review recent regulatory practice with regards to the cost of debt. The report from PwC, as included in the workshop papers, advised that:

- it remains current regulatory practice to determine the risk free rate from a 20-day average of recent observed yields of Commonwealth Government bonds;
- no challenges to this method for determining the risk free rate have been brought to the ACT recently;
- no Australian regulator has applied a cost of debt estimate that is based on the cost of bank debt; and
- there has been a sustained shift in the practice of both the Australian Energy Regulator (AER) and ERA to apply a value of gamma of 0.25.

The IMO confirmed to attendees that it would progress with a Procedure Change Proposal to amend the value of gamma, and would retain the determination of the risk free rate and debt risk premium from observed yields of Commonwealth Government and corporate bonds respectively.

In addition to the review by PwC, the IMO separately consulted with banks to determine whether banks maintained a robust benchmark or index of the cost of debt that was publicly available. The banks contacted confirmed that the cost of bank debt was determined on a project-by-project basis and that no such benchmark was publicly available.

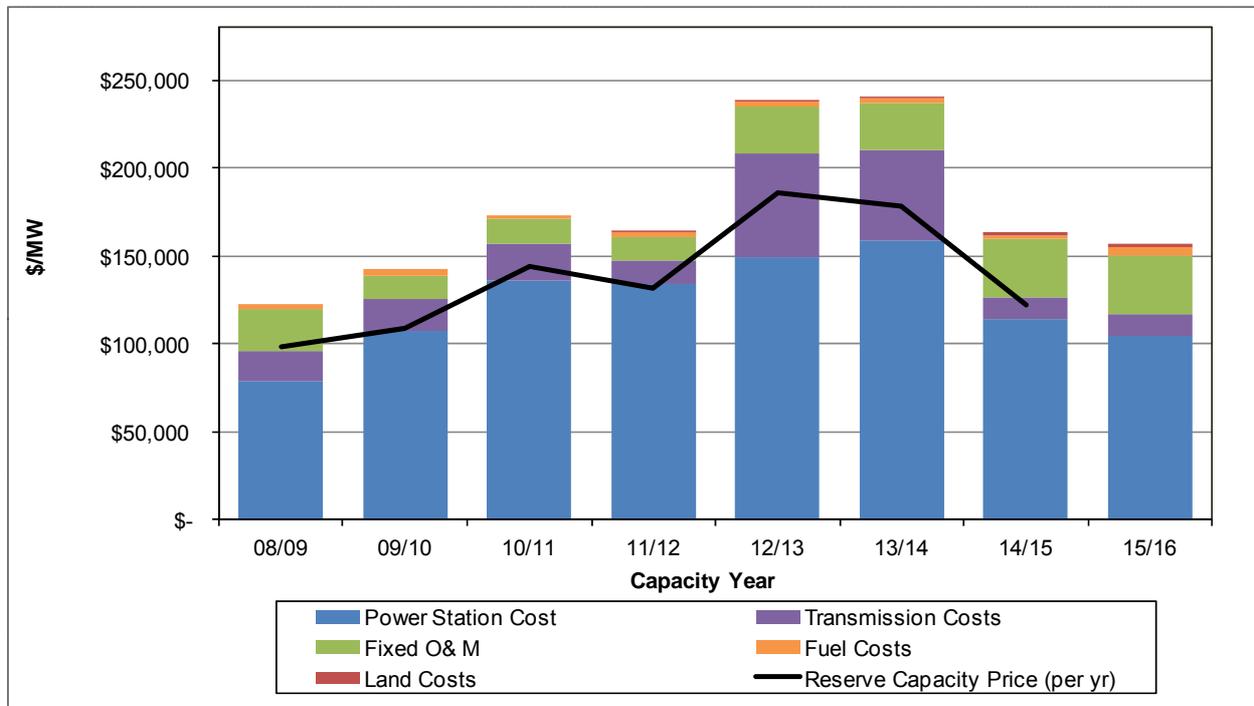
Historical variation of MRCP

Figure A indicates that the MRCP has been relatively stable aside from the MRCPs for 2012/13 and 2013/14, which are outliers. This graph shows the MRCPs for the period from 2008/09 to 2015/16, including the contribution of the various component costs. Please note the individual cost components include the impact of the WACC.

As shown in the graph, the higher MRCPs for 2012/13 and 2013/14 were largely driven by higher estimates of Transmission Costs, which are provided by Western Power. The IMO notes that the method used by Western Power changed for the 2012/13 MRCP following discussions between the IMO and Western Power. The IMO considered that estimates provided by Western Power for previous years lacked detail and transparency. However, the IMO notes that the 2012/13 estimate provided by Western Power for the shared connection cost at the cheapest location was more than 350% higher than the indicative value provided for the 2011/12 MRCP.

As part of the five-yearly review of the MRCP, assisted by the Maximum Reserve Capacity Price Working Group (MRCPWG), SKM reviewed the methodology employed by Western Power. In its analysis, SKM highlighted that the method used for the 2012/13 and 2013/14 MRCPs required a broad range of assumptions that can lead to significant inaccuracies and year-to-year volatility.

Figure A: MRCPs for 2008/09 to 2015/16 Capacity Years



An amended methodology for estimating the Transmission Costs was implemented following this review³, based on a weighted average of actual contribution costs charged by Western Power. Western Power applied the new methodology for the first time for the 2014/15 MRCP. The outcomes of this methodology have been significantly lower than the estimates provided by Western Power for 2012/13 and 2013/14, suggesting that the higher cost estimates provided for those years were not reflective of the capital contributions actually being charged to project developers that have either secured connection or been provided with an Access Offer.

Outside of the 2012/13 and 2013/14 MRCPs, the Transmission Cost component of the MRCP has been relatively stable with estimates falling within 20% of the mean for the remaining years⁴.

The IMO notes that the current methodology for estimating the Transmission Costs uses several years of data in a weighted average calculation. This method is expected to result in lower volatility than occurred under the previous methodology employed by Western Power for 2012/13 and 2013/14.

³ See Procedure Change PC_2011_06.

⁴ This analysis excludes the effect of the WACC.

The IMO also notes that the Power Station Cost increased by 101% from the 2008/09 MRCP to the 2013/14 MRCP, driven by significant increases in commodity prices and WA labour costs. The introduction of inlet cooling into the design of the theoretical power station, following the 5-yearly MRCP methodology review, has moderated this increase and was the predominant reason for the reduction in the Power Station Cost from 2013/14 to 2014/15. This change was implemented as it reflects current market practice. All OCGT generation facilities constructed in the SWIS since the commencement of the WEM have incorporated inlet cooling.

Procedure Change PC_2012_08

As noted above, Procedure Change Proposal PC_2012_08⁵ to amend the Market Procedure has been approved since the publication of the Draft Report and the revised Market Procedure commenced on 15 January 2013.

This Final Report has been prepared in accordance with the revised Market Procedure. The only amendment that has affected the calculated MRCP is a change in the value of gamma from 0.5 to 0.25.

ERA Review of MRCP Methodology

The ERA is required under clause 2.26.3 to review the methodology for setting the MRCP not later than the fifth anniversary of the first Reserve Capacity Cycle and has indicated that it will perform this review in 2013. Stakeholders will have the opportunity to provide submissions as part of this review.

⁵ See http://www.imowa.com.au/PC_2012_08

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1. INTRODUCTION

The Maximum Reserve Capacity Price (MRCP) sets the maximum bid that can be made in a Reserve Capacity Auction and is used as the basis to determine an administered Reserve Capacity Price if no auction is required. Each year the Independent Market Operator (IMO) is required to determine the MRCP in accordance with the *Market Procedure: Maximum Reserve Capacity Price*⁶ (Market Procedure). Following the public consultation process, the IMO must consider submissions and propose a final revised MRCP value and submit that value, along with a final report (produced in accordance with clause 4.16.7 of the Market Rules) to the Economic Regulation Authority (ERA) for approval.

This Final Report presents the updated component costs as determined for the 2013 Reserve Capacity Cycle. The IMO uses publicly available information, together with advice from independent engineering and economics consultants and Western Power, to update the various input parameters that are used in calculating the MRCP.

This Final Report is produced in accordance with clause 4.16.6 of the Wholesale Electricity Market Rules (Market Rules).

1.1 Reserve Capacity Cycle timing

This Final Report has been prepared for the 2013 Reserve Capacity Cycle and the MRCP will be effective from 1 October 2015 through to 1 October 2016.

1.2 General costing methodology and structure of this Final Report

The yearly determination of the MRCP requires the IMO to develop estimates of the following constituent costs:

- the capital cost of a 160 MW Open Cycle Gas Turbine (OCGT) power station with inlet cooling, located within the South West interconnected system (SWIS);
- the land cost associated with developing and constructing the power station;
- the cost associated with connection of the power station to the transmission system;
- the cost associated with building liquid fuel storage and handling facilities for the power station;
- the fixed Operational and Maintenance (O&M) costs associated with the power station and the transmission facilities listed above;
- a margin for legal, approval, financing and insurance costs and contingencies; and
- the Weighted Average Cost of Capital (WACC).

In determining the proposed MRCP, the IMO has sought advice from various consultants and

⁶ The Market Procedure is available at <http://www.imowa.com.au/market-procedures>

agencies. Table 1 lists these organisations and the input parameters for which they have provided advice.

Table 1: Consultants and agencies

Organisation	Cost estimate(s) provided
Sinclair Knight Merz (SKM)	Power station capital cost Margin for indirect costs and contingencies Fixed Fuel Cost O&M costs
Landgate	Land cost
Western Power	Transmission connection cost
Pricewaterhouse Coopers (PwC)	Debt Risk Premium

As shown in Table 1, SKM has been engaged to determine the Fixed Fuel Cost that was provided by GHD last year. PwC has been appointed to determine the Debt Risk Premium (DRP). The remaining annual WACC parameters have been determined by the IMO for the first time using available market data.

1.3 Public Consultation

Following publication of the Draft Report on 21 November 2012, the IMO invited public submissions until the submission deadline of 19 December 2012. The IMO received five submissions from the following parties:

- Community Electricity;
- Verve Energy;
- Perth Energy;
- Merredin Energy; and
- Alinta Energy.

A summary of the submissions received and the IMO's response to each of the issues raised is included in Section 5 of this report. The full details of the submissions are available on the IMO website.

1.4 MRCP outcome for the 2013 Reserve Capacity Cycle

In accordance with clause 4.16.7 of the Market Rules and having considered the submissions received, the IMO proposes a final revised value of the MRCP of \$157,000 per MW per year for the 2013 Reserve Capacity Cycle.

This is a reduction of 4.2% from the 2012 MRCP of \$163,900 per MW per year.

A detailed analysis of the changes since the 2014/15 MRCP is included in Section 4.4 of this report. This analysis is presented for both scenarios described above.

1.5 Stakeholder workshop held on 1 November 2012

In submissions on the 2014/15 MRCP, a number of stakeholders suggested that the capital structure assumptions that underpin the WACC calculation may not be appropriate for the current composition of the WEM. In particular, these stakeholders suggested that it was likely that a generator in the WEM would raise debt finance from a bank rather than through the corporate bond market. The IMO committed to review these assumptions in 2012.

The IMO commissioned PricewaterhouseCoopers (PwC) to review recent regulatory practice with regards to the cost of debt. PwC was requested to only consider Australian regulators whose decisions are reviewable by the ACT. The IMO also requested advice with regard to regulatory practice in determining:

- the risk free rate, given that Commonwealth Government bond yields have further declined to historic lows; and
- the value of imputation credits (gamma), given the observed shift in regulatory decisions by the Australian Energy Regulator (AER) and the ERA.

PwC advised that:

- it remains current regulatory practice to determine the risk free rate from a 20-day average of recent observed yields of Commonwealth Government bonds;
- no challenges to this method for determining the risk free rate have been brought to the ACT recently;
- no Australian regulator has applied a cost of debt estimate that is based on the cost of bank debt; and
- there has been a sustained shift in the practice of both the AER and ERA to apply a value of gamma of 0.25.

In addition to the review by PwC, the IMO separately consulted with banks to determine whether banks maintained a robust benchmark or index of the cost of debt that was publicly available. The banks contacted confirmed that the cost of bank debt was determined on a project-by-project basis and that no such benchmark was publicly available.

The IMO confirmed to attendees that it would progress with a Procedure Change Proposal to amend the value of gamma, and would retain the determination of the risk free rate and DRP from observed yields of Commonwealth Government and corporate bonds respectively.

1.6 Procedure Change Proposal

Procedure Change Proposal PC_2012_08⁷ to amend the Market Procedure has been approved since the publication of the Draft Report and the revised Market Procedure commenced on 15 January 2013. This proposal included two changes that have the potential to impact the

⁷ See http://www.imowa.com.au/PC_2012_08

calculation of the MRCP:

- The franking credit value, gamma, would be amended from 0.5 to 0.25 to align with recent Australian regulatory practice. Following a decision by the Australian Competition Tribunal in May 2011⁸, both the AER and ERA have regularly applied a value of 0.25 in regulatory decisions. This proposed change will have a material impact on the MRCP as noted in Section 1.4 above.
- With the commencement of the Balancing Market in 2012, the power station would be required to comply with the Balancing Facility Requirements. However, the IMO notes that the Balancing Facility Requirements currently consist of communication systems that have a negligible impact on the capital cost for the power station.

This Final Report has been prepared in accordance with the revised Market Procedure. The only amendment that has affected the calculated MRCP is the change in the value of gamma from 0.5 to 0.25.

1.7 ERA Review of MRCP Methodology

The ERA is required under clause 2.26.3 to review the methodology for setting the MRCP not later than the fifth anniversary of the first Reserve Capacity Cycle and has indicated that it will perform this review in 2013. Stakeholders will have the opportunity to provide submissions as part of this review.

1.8 Supporting Documents

The following related documents are available on the IMO website (<http://www.imowa.com.au/mrcp>):

- *Draft Report: Maximum Reserve Capacity Price Review for the 2015/16 Capacity Year*,
- MRCP Calculation Spreadsheet, Final Report version;
- WACC parameter calculation spreadsheet (risk free rate and inflation), Final Report version;
- PwC letter, dated 18 December 2012, *Update of debt risk premium using the ERA's debt yield methodology*;
- SKM letter, dated 2 January 2013, *2015/16 MRCP Construction Insurance Cost*;
- MRCP Calculation Spreadsheet, Draft Report versions:
 - Version 1 is prepared in accordance with the current Market Procedure, using a gamma of 0.5;
 - Version 2 is prepared with a gamma of 0.25 as would be adopted if PC_2012_08 is accepted;

⁸ Application by Energex Limited (Gamma) (No 5) [2011] A CompT 9 (12 May 2011)

- SKM report, dated 24 January 2013, *Review of the Maximum Reserve Capacity Price 2013* (Final Report version)⁹;
- PwC letter, dated 11 October 2012, *Debt risk premium using the ERA's debt yield methodology*;
- WACC parameter calculation spreadsheet (risk free rate and inflation), Draft Report version;
- Letter from Landgate, dated 11 September 2012, *Land Values for Reserve Capacity Price*;
- Western Power report, dated 8 October 2012, *Total Transmission Cost Estimate for the Maximum Reserve Capacity Price for 2015/16*¹⁰;
- PwC letter, dated 15 October 2012, *Review of debt and equity related issues within the WACC used in the Maximum Reserve Capacity price*; and
- Minutes of the WACC Workshop held 1 November 2012.

⁹ Please note that updates have been made to pages 7 and 36 of SKM's Report since publication of the Draft Report. SKM has corrected errors in the \$/kW and cost escalation calculations. Please note that the IMO's calculations in the Draft Report were correct as they had not used these figures.

¹⁰ Please note that an update has been made to this report since publication of the Draft Report to correct a discrepancy in the easement value in section 2.3.3 of Western Power's Report. The IMO's Draft Report was based on the correct value in section 2.3.4.

2. ESCALATION OF COSTS

The Market Procedure describes a number of escalation factors that are applied to various costs within the MRCP. These escalation factors are used to estimate the changes in costs from the time at which price estimates are derived to the time at which, for the purpose of the MRCP, the capital is assumed to be outlaid.

The calculation for the 2013 MRCP is based on a theoretical power station that would commence operation on 1 October 2015. In line with the Market Procedure, capital costs are escalated to 1 April 2015 and O&M costs have been escalated to 1 October 2015. The various input costs have been provided to the IMO at different dates, which are provided in Chapter 3 of this report.

The IMO proposes to use the escalation factors summarised in Table 2, which are unchanged from the values in the Draft Report.

Table 2: Escalation Factors

Escalation Factor	Financial Year				
	2012/13	2013/14	2014/15	2015/16	2016/17
CPI	3.25%	2.50%	2.50%	2.50%	
Power Station Capital Cost	1.62%	4.39%	3.33%	2.85%	2.85%
Connection Asset O&M Cost	4.32%				
Power Station O&M Cost	3.79%	3.60%	3.61%	3.62%	
Transmission Connection Cost	-2.91%				

Where possible cost escalation factors are based on forecast price movements. Labour costs are projected based on long-run historical cost escalation, observed in labour price indices published by the Australian Bureau of Statistics.

The following escalation factors have been determined for use in the MRCP:

- The CPI (Consumer Price Index) escalation rates are determined from the forecasts of the Reserve Bank of Australia (RBA)¹¹ as described in the Market Procedure. The mid-point of the RBA's target range of inflation is used beyond the period of the forecasts, resulting in a constant escalation rate from the 2015/16 financial year onwards.
- The power station capital cost escalation factors have been determined by SKM and are published in its report. SKM has calculated these escalation factors by weighting historical and forecast movements of specific input cost drivers such as steel, copper and labour costs. The weighting of each input cost driver relates to its contribution to the total capital cost of the power station.
- Escalation factors for connection asset O&M costs have also been calculated by SKM.

¹¹ Published in the Statement on Monetary Policy, November 2012.

SKM has noted in previous years that fixed O&M costs for these assets are dominated by labour costs, so the labour cost escalation rates are used to escalate these O&M costs. The labour cost escalation factors are determined from the 10-year average movement in Labour Price Indices, so a single escalation rate has been applied in the MRCP calculation.

- Escalation factors for power station O&M costs have also been determined by SKM. These escalation factors are derived by weighting labour escalation rates and CPI.
- The transmission connection cost escalation factor is determined from the average annual change in Western Power cost estimates for a fixed transmission connection scope, as described in Section 2.4 of the Market Procedure. This has been provided in Western Power's report.

Further detail on the development of these escalation factors can be found in the applicable supporting documents on the IMO website at <http://www.imowa.com.au/mrcp>.

3. INPUT PARAMETERS TO THE MAXIMUM RESERVE CAPACITY PRICE CALCULATION

3.1 Power Station Capital Costs (PC)

As with the 2012 MRCP determination, the IMO commissioned SKM to provide generation plant capital costs for a 160 MW OCGT power station located within the SWIS. This is the sixth year in which SKM has provided this estimate to the IMO. The scope provided to SKM was identical to last year in all respects, except that the facility now needs to meet the Balancing Facility Requirements as implemented from 1 July 2012.

SKM developed the capital cost estimate for a generic 160 MW OCGT power station (including procurement, installation and commissioning) using Thermoflow GT Pro[®]/PEACE[®] and benchmarked the costs of equipment and labour against actual projects.

For the purposes of the 2013 MRCP:

PC = A\$829,446.75 per MW

This price represents a decrease of 3.4% from the corresponding value for the 2012 MRCP and is unchanged from the value in the Draft Report. The key drivers of this change have been weakening steel and copper prices as well as a strengthening of the Australian dollar versus the Euro. SKM notes in its report that the *“weakening Euro or conversely the relative strength of the Australian dollar results in a reference price decrease of approximately 10% for the SGT5-200E gas turbine plant”*.

3.2 Legal, financing, insurance, approvals, other costs and contingencies (M)

The parameter M is defined as a margin to cover legal, financing, insurance, approvals, other costs and contingencies. SKM was commissioned to provide an estimate of these costs for 2013. This is the fifth year in which SKM has provided this parameter for the IMO.

The margin M is estimated from the costs associated with recent comparable developments, excluding any abnormal costs that may be particular to individual projects. Costs are scaled for a 160 MW power station where relevant. M is added as a fixed percentage of the capital cost of developing the power station.

For the purposes of the 2013 MRCP:

M = 18.87%

This value has risen from the corresponding value of 18.2% for the 2012 MRCP. The margin M is added as a fixed percentage of the capital cost of developing the power station. However, SKM has advised that many costs included under M, such as engineering design, project management and legal costs are fixed in nature. As the Power Station Capital Costs (PC) have reduced, these fixed costs represent a higher percentage of PC.

It has also increased from the value of 18.77% in the Draft Report in response to a submission by Merredin Energy. Merredin Energy pointed out that SKM had maintained the allowance for construction insurance at 0.4% of the EPC cost of the plant, consistent with the 2012 MRCP, but that the IMO had separately received advice from an insurance broker that insurance premiums had risen by approximately 22.5% since last year (see Section 3.8.4 of this report). The IMO consulted with SKM, which has increased the allowance for construction insurance from 0.4% to 0.5%, as detailed in the letter from SKM dated 2 January 2013.

3.3 Transmission Connection Costs (TC)

For the 2013 MRCP, Western Power has calculated the transmission connection cost estimate as part of its obligations under the Market Procedure.

The Transmission Connection Cost estimate provided for this MRCP determination is based on actual connection costs and Access Offers that have been determined by Western Power. As the connection costs for individual projects are confidential to Western Power and the project developer, Western Power has provided an audit report verifying the connection cost data used in the calculation.

The Transmission Connection Cost is calculated using actual connection costs for projects within a 5-year window, and weights each connection cost according to the year that the facility commenced, or is expected to commence, operation. The Transmission Connection Cost is based on a 5 year weighted average calculation, not directly from the shallow connection cost estimate determined by Western Power.

This methodology for estimating the Transmission Connection Cost was implemented following the five-yearly review of the MRCP, assisted by the Maximum Reserve Capacity Price Working Group (MRCPWG), and was applied by Western Power for the first time for the 2014/15 MRCP. In analysis for the MRCPWG, SKM highlighted that the method employed by Western Power for the 2012/13 and 2013/14 MRCPs required a broad range of assumptions that can lead to significant inaccuracies and year-to-year volatility.

The outcomes of this methodology are significantly lower than the estimates provided by Western Power for 2012/13 and 2013/14, suggesting that the higher cost estimates for those years were not reflective of the capital contributions actually being charged to project developers that have either secured connection or been provided with an Access Offer.

For the purposes of the 2013 MRCP:

TC = A\$115,124 per MW

This value is approximately 4.8% higher than the corresponding value in 2012 and is unchanged from the value in the Draft Report. The IMO notes that, outside of the 2012/13 and 2013/14 MRCPs, the Transmission Connection Cost component of the MRCP has been

relatively stable with estimates falling within 20% of the mean for the remaining years¹².

For further information regarding the costing provided by Western Power, please refer to the Western Power report¹³ published on the IMO website (<http://www.imowa.com.au/mrcp>).

3.3.1 Easement Costs

To assist Western Power in its determination of the transmission connection cost estimate, the IMO provides an estimate of easement costs for the direct connection scope described in step 2.4.2 of the Market Procedure.

The IMO has estimated the easement cost on the same basis as last year.

- The easement is assumed to be 2km long and 60m wide (an area of 12 hectares).
- The IMO has assumed that a project developer may not be required to purchase the full portion of land and could instead secure easement rights for some or all of the easement. As such, the IMO has estimated the easement costs to be 50% of the purchase value of the land, consistent with the 2012 MRCP.
- The purchase price per hectare has been estimated by dividing the average cost of the land parcels (as valued by Landgate) by three hectares. Note that this cost estimate is as at 30 June 2012.

To meet the requirements for the transmission connection cost estimate (Section 2.4 of the Market Procedure), the IMO has escalated the resulting value forward to 30 June 2013 using the CPI escalation factor for the 2012/13 financial year of 3.0%. Further escalation of this cost to 1 April 2015 occurs within the transmission connection cost estimate methodology where required.

The IMO has estimated that the easement cost as at 30 June 2013 is A\$5.147M, down 3.6% from the 2012 value of A\$5.339, predominantly due to a small reduction in the cost of land at Pinjar and Kwinana. This value is unchanged since the Draft Report.

3.4 Fixed Fuel Costs (FFC)

Fixed Fuel Costs for the determination of the 2013 MRCP have been estimated by SKM. The Fixed Fuel Costs were previously calculated by GHD, which provided these estimates for the last five years.

SKM has provided its cost estimate as at 30 June 2012, which has been escalated to 1 April 2015, using the CPI escalation rates from Table 1.

For the purposes of the 2013 MRCP:

¹² This analysis excludes the effect of the WACC.

¹³ See Western Power report *Total Transmission Cost Estimate for the Maximum Reserve Capacity Price for 2015/16*.

FFC = A\$7.069 M

This price represents an increase of 122% from the corresponding value for the 2012 MRCP. SKM has estimated the Fixed Fuel Costs based on the same scope as the previous estimates provided by GHD. SKM has developed its estimate with the benefit of recent project experience in Western Australia.

This value is unchanged since the Draft Report.

3.5 Land Costs (LC)

The IMO commissioned Landgate to update the land cost estimates to be used in the MRCP determination. This is the fifth year in which Landgate has provided these estimates to the IMO.

These estimated land valuations are based on guidelines outlined in the Market Procedure. Valuations were conducted for seven locations in regions where development of a power station within the SWIS would be reasonably likely. The regions included were:

- Collie Region;
- Kemerton Industrial Park Region;
- Pinjar Region;
- Kwinana Region;
- North Country Region (both Geraldton and Eneabba); and
- Kalgoorlie Region.

Land sizes and costs were determined in accordance with the Market Procedure. Three hectare sites were used for all locations except Kemerton, for which the smallest available lot is five hectares. This approach is identical to that used in the 2012 MRCP.

Landgate has provided its estimate of the cost of each land parcel as at 30 June 2012, excluding stamp duty. The IMO has added the applicable stamp duty to each land parcel cost, determined by the online calculator provided by the Office of State Revenue¹⁴. In accordance with the Market Procedure, the IMO has calculated the mean of the seven valuations. This average land cost has been escalated to 1 April 2015, using the CPI escalation rates from Table 1.

For the purposes of the 2013 MRCP:

LC = A\$2.694 M

This price represents a decline of 3.9% from the corresponding value for the 2012 MRCP. This reduction in a relatively small component of the MRCP is predominantly due to a reduction in

¹⁴ <http://rol.osr.wa.gov.au/taxcal/>

the estimated land costs at Pinjar and Kwinana. The estimated cost per hectare at all other locations has remained unchanged.

This value is unchanged since the Draft Report.

3.6 Weighted Average Cost of Capital (WACC)

For the 2013 MRCP determination the IMO commissioned PwC to calculate the DRP and has calculated the remaining WACC components itself from publicly available information.

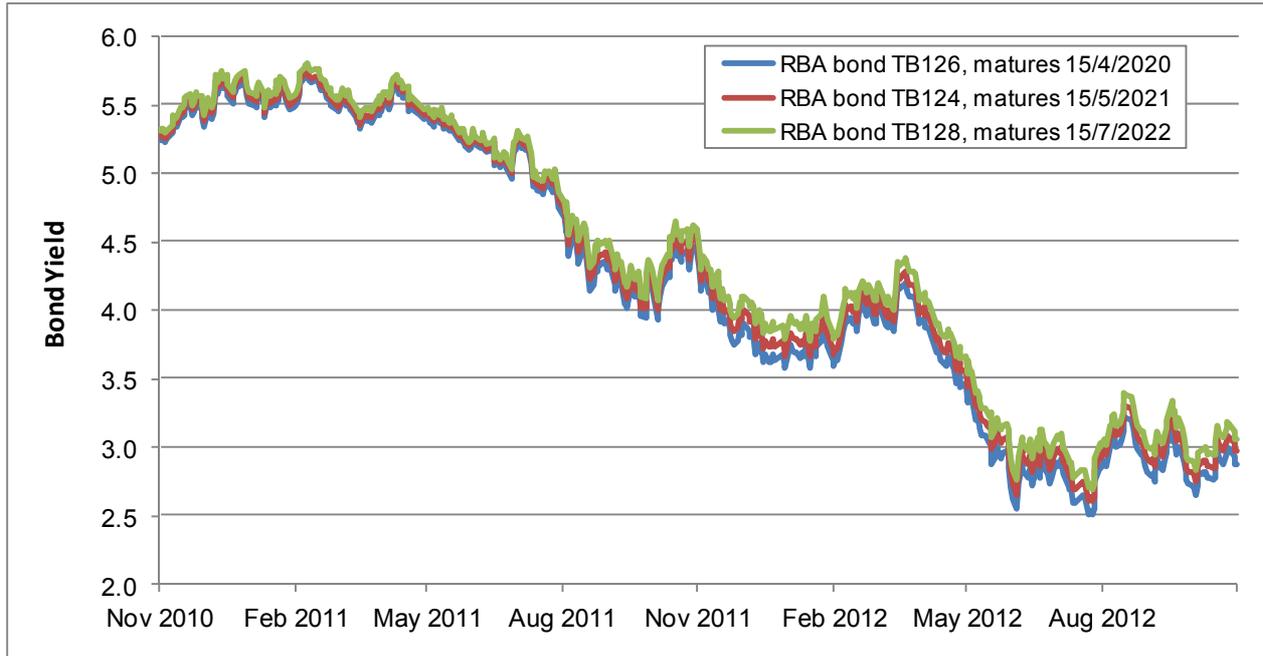
The calculations of the risk free rate and inflation are provided in a spreadsheet that is published on the IMO website at <http://www.imowa.com.au/mrcp>. The corporate tax rate is determined to be 30%, consistent with last year.

The WACC is determined according to the Capital Asset Pricing Model (CAPM), with bond yields considered in both the costs of equity and debt. The nominal risk free rate is determined from observed yields of Commonwealth Government bonds, while the DRP is derived from observed yields of corporate bonds.

The IMO notes that the WACC used for the determination of the 2013 MRCP reflects continuing turbulence in global financial markets, largely as a result of continuing concerns over sovereign debt levels in Europe and the slow rate of economic recovery in the US.

As market volatility has remained, investors continue to prefer lower risk investments such as government and high quality corporate bonds. Yields on RBA bonds have continued to decline since the determination of the 2012 MRCP. This is illustrated in Figure 1, which shows indicative daily yields of Commonwealth Government securities with maturity dates approximately ten years from now.

Figure 1: Stock market results and bond yields, Nov 2010 to Dec 2012¹⁵



A detailed calculation of the WACC is provided in Appendix A.

For the purposes of the 2013 MRCP:

WACC = 5.95%

This WACC value is significantly lower than the WACC of 6.83% determined for the 2012 MRCP. This reduction is driven by lower values for two input parameters.

- The nominal risk free rate has reduced from 3.92% to 3.14%. This parameter has been calculated from Commonwealth Government security yields using the same method as last year.
- The DRP has reduced from 4.13% to 2.71%. For 2013 the DRP has been calculated using the ERA's "Bond-Yield Approach". For the 2012 MRCP this parameter was calculated from Bloomberg fair value data. This methodology change is explained in Section 3.6.1.

These reductions have been partially offset by a reduction in the value of gamma from 0.5 to 0.25. This reduction is facilitated by the approval and commencement of Procedure Change Proposal PC_2012_08.

The WACC is slightly lower than the value proposed in the Draft Report with a gamma value of 0.25 (6.03%) due to the reduction in the DRP.

¹⁵ Bond yield data sourced from RBA Statistical Table F16, available from <http://www.rba.gov.au/statistics/tables/>

3.6.1 Debt Risk Premium (DRP)

The Market Procedure requires that “*The IMO must determine the methodology to estimate the DRP, which in the opinion of the IMO is consistent with current Australian accepted regulatory practice.*”

For the 2014/15 MRCP the DRP was determined from the 7-year Bloomberg BBB fair value curve, extrapolated to 10 years using the difference between the AAA 7-year and 10-year fair value curves.

At that time, the IMO noted that the ERA had developed the “Bond-Yield Approach” for determination of the DRP, and had applied this in its *Final decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distribution System*. However, the IMO also noted that this methodology had been appealed to the Australian Competition Tribunal (ACT) and that it could not be considered “*accepted regulatory practice*” until such time as it was upheld by the ACT.

In June 2012 the ACT broadly upheld the “Bond-Yield Approach” methodology. Consequently, the IMO considers that the ERA’s ‘Bond-Yield Approach’ now represents current accepted regulatory practice in Australia.

Further, the AER recently noted in its *Final Decision, Roma to Brisbane Pipeline 2012-13 to 2016-17* that it considered that the Bloomberg methodology overstated the cost of debt, that the “Bond-Yield Approach” had been upheld by the ACT, and that it would be initiating its own review of methodologies for determining the DRP.

PwC has provided three distinct estimates in its note to the IMO based on different subsets of bonds. In the Draft Report, the IMO applied the value that represents a strict application of the ERA’s approach in the WA Gas Networks final revised decision, utilising bonds with credit ratings of BBB and BBB+, with a term to maturity of at least two years.

However, in its submission, Alinta Energy questioned the appropriateness of including bonds with a credit rating of BBB+ in the determination of the DRP.

Further, the IMO notes that step 2.9.7(h) of the Market Procedure requires that the DRP be determined from “*the observed annualised yields of Australian corporate bonds which have a BBB (or equivalent) credit rating*”.

Given this, the IMO considers it appropriate that the DRP for the MRCP be calculated from BBB rated bonds only and has applied this calculation in this Final Report. The IMO notes that BBB is the lowest credit rating that is considered “investment grade”.

3.7 Capital Costs (CAPCOST)

The term CAPCOST refers to the total capital cost expressed in millions of Australian Dollars for the 160 MW OCGT power station. This is calculated by using the following formula:

$$\text{CAPCOST} = ((\text{PC} \times (1+\text{M}) + \text{TC}) \times \text{CC} + \text{FFC} + \text{LC}) \times (1+\text{WACC})^{1/2}$$

For the purposes of the 2013 MRCP:

CAPCOST = A\$190.939 M

3.8 Fixed Operation & Maintenance Costs (ANNUALISED_FIXED_O&M)

3.8.1 Generation

For the 2013 determination, SKM has determined the fixed O&M costs for the generator assets using the same methodology as last year. This is the seventh MRCP for which SKM has provided the estimate of these costs.

An annuity is calculated taking the first 15 years of O&M costs provided by SKM. The SKM report¹⁶ details the total fixed O&M costs of the OCGT to year 15 as A\$31.390 M in June 2012 terms. This cost is annualised and then escalated forward by 3-1/4 years, to 1 October 2015 (the point at which these costs are assumed to commence), using the power station O&M escalation factors.

For the purposes of the 2013 MRCP:

Generation Fixed O&M Costs = A\$14,750.56 per MW per year

This cost represents an increase of 3.4% from the corresponding value for the 2012 MRCP and is unchanged from the value in the Draft Report.

3.8.2 Transmission

For the 2013 determination, SKM provided the fixed O&M costs of the switchyard and transmission line assets using the same methodology as last year. This is the seventh MRCP for which SKM has provided the estimate of these costs.

An annuity is calculated taking the first 15 years of O&M costs provided by SKM. The SKM report¹⁷ details the total fixed O&M costs for the switchyard and transmission line assets. This cost is annualised and then escalated forward by 3-1/4 years, to 1 October 2015 (the point at which these costs are assumed to commence), using the connection asset O&M escalation factor.

For the purposes of the 2013 MRCP:

Transmission Fixed O&M Costs = A\$425.15 per MW per year

This cost represents an increase of 1.6% from the corresponding value for the 2012 MRCP and is unchanged from the value in the Draft Report.

3.8.3 Network access charges

¹⁶ See Table 3-2 of the SKM report *Review of the Maximum Reserve Capacity Price 2013*.

¹⁷ See Tables 4-1 and 4-2 of the SKM report *Review of the Maximum Reserve Capacity Price 2013*.

Western Power's Price List provides the various charges for network access and related services that apply for generation facilities. It is assumed that the power station is connected to the transmission system, so reference Tariff TRT2 is used for the purpose of the MRCP.

The IMO notes that the ERA has approved Western Power's 2012/13 Price List¹⁸ since the publication of the Draft Report. The tariffs used for the MRCP are unchanged from the price list used in the Draft MRCP Report.

As the use of system charge varies by location, the IMO has considered the list of locations nominated in step 2.7.1 of the Market Procedure, and has used the unit price for the most expensive of these locations. In the proposed 2012/13 Price List, Bluewaters has the highest price among power stations located in the regions listed in the Market Procedure.

For the purpose of the MRCP, the costs are assumed as at 1 July 2012 and have been escalated forward to 1 October 2015. The CPI escalation factor has been used as required by step 2.5.6(c) of the Market Procedure.

For the purposes of the 2013 MRCP:

Fixed Network Access Costs = A\$13,687.07 per MW per year

This cost represents a decrease of 4.6% from the corresponding value for the 2012 MRCP due to the reductions in the Western Power tariffs, and is unchanged from the value in the Draft Report.

3.8.4 Insurance costs

The Market Procedure requires that the Fixed O&M component of the MRCP include annual insurance costs in respect of power station asset replacement, business interruption and public and products liability insurance as required under network access arrangements with Western Power. This is the second year that these costs have been included in the MRCP.

For the 2012 MRCP, the IMO estimated the relevant insurance premiums through consultation with two well-known insurance brokers and consideration of insurance renewal documentation provided by two Market Participants. The insurance brokers requested that they not be named. For the 2013 MRCP the IMO sought updated advice from three insurance brokers, including the same brokers that had previously provided quotations.

At the time of preparing this report advice has been received from one broker that premiums in respect of asset replacement and business interruption insurance had increased by a median of approximately 22.5%, driven by recent adverse domestic claims experience in the area of electricity generation and an increase in re-insurance costs worldwide. Given that the IMO had calculated the premium in 2011 as 0.23% of the limit of liability, this would increase the premium

¹⁸ Available at <http://www.westernpower.com.au/aboutus/accessArrangement/accessArrangement.html>

to 0.28%. This broker also suggested that public and products liability insurance premiums were at similar levels to last year.

Another broker contacted by the IMO has suggested a premium for asset replacement and business interruption insurance of 0.30% of the limit of liability.

Based on previous and updated advice, the insurance premiums have been estimated as follows:

- Asset replacement and business interruption insurance is estimated as A\$690,679 per year as at 1 April 2015, calculated as 0.29% of the limit of liability at that date. The limit of liability has been determined as the sum of the capital construction cost, value of fuel and the potential refund liability during the period of re-construction.

For the purpose of asset replacement insurance, the capital construction cost and value of fuel have been calculated as

$$PC \times (1 + M) \times CAP + FFC$$

where

PC is the Power Station Capital Cost (see Section 3.1 of this report);

M is margin M (see Section 3.2 of this report);

CAP is the expected Capacity Credit allocation (see Section 4.3 of this report); and

FFC is the Fixed Fuel Cost (see Section 3.4 of this report).

For business interruption insurance, the IMO has included the potential refund liability for the facility for two years. While a construction period of one year is assumed in the application of the WACC in the MRCP calculation, a period of time would be required prior to the commencement of any reconstruction works following a loss event (for example, for procurement of services, building approvals and any demolition or clearing works). The weighting of capacity refunds to peak demand periods means that a Market Participant may be required to refund two years worth of capacity payments in a period of less than 15 months.

Since the Draft Report, the IMO has increased the limit of liability to include the cost of fuel and has included an allowance of \$20,000 to meet the cost of an annual insurance survey. These were recommended by Merredin Energy in its submission. The IMO consulted with two well-known insurance brokers on these issues. They confirmed that it is common practice for power station operators to insure liquid fuel stock at a predefined level. The same brokers confirmed that it was common industry practice for an annual site survey to be performed.

- Public and products liability insurance is estimated as A\$120,000 per year as at 30 June 2012, based on a limit of \$50M for any one occurrence.

Based on the information considered by the IMO, the premium rates are consistent with the following assumptions:

- A newly constructed generation facility with on-site diesel storage;

- Location in a rural region of the SWIS, outside of any cyclone risk;
- Inclusion of coverage for machinery breakdown; and
- Deductibles of \$500,000 for property damage, \$100,000 for liability and 60 days for business interruption insurance.

The premiums above have been estimated to include the 2% terrorism levy and 10% stamp duty.

The insurance costs have been escalated forward to 1 October 2015 (the point at which these costs are assumed to commence), using the CPI escalation factor.

For the purposes of the 2013 MRCP:

Insurance Costs = A\$5,385.90 per MW per year

This value is 23.4% higher than the corresponding value in 2012. It should be highlighted that insurance costs related to the development phase of the power station are included within margin M.

This value is 4.5% higher than the corresponding value in the Draft Report due to the increased limit of liability to cover insurance of fuel stocks as well as the inclusion of an allowance of \$20,000 to meet the cost of an annual insurance survey.

3.8.5 Total Fixed Operation & Maintenance Costs

For the purposes of the 2013 MRCP:

ANNUALISED_FIXED_O&M = A\$34,239 per MW per year

Total fixed operation and maintenance costs have increased by 2.5% compared to last year.

4. MAXIMUM RESERVE CAPACITY PRICE CALCULATION

4.1 Annualised Capital Costs (ANNUALISED_CAPCOST)

The annualised capital cost is determined using:

- the capital cost of A\$190.939 M, as determined in Section 3.7;
- the WACC of 5.95%, as determined in Section 3.6; and
- a term of 15 years, as required by the Market Procedure.

For the purposes of the 2013 MRCP:

ANNUALISED_CAPCOST = A\$19.600 M per year

4.2 Annualised Fixed Operation & Maintenance Costs (ANNUALISED_FIXED_O&M)

The total annualised fixed O&M costs are outlined in Section 3.8.5. For the purposes of the 2013 MRCP:

ANNUALISED_FIXED_O&M = A\$34,239 per MW per year

4.3 Expected Capacity Credit Allocation (CC)

SKM has provided its estimate of the output of the reference facility at 41°C, which represents the expected Capacity Credit allocation for the facility. For the purposes of the 2013 MRCP:

CAP = 159.6 MW

4.4 Calculation

The Maximum Reserve Capacity Price is calculated using the following equation as required by the Market Procedure:

$$\text{MRCP} = (\text{ANNUALISED_FIXED_O\&M} + \text{ANNUALISED_CAP_COST} / \text{CC})$$

Using the values determined by the IMO and presented in previous sections, the MRCP for the 2013 Reserve Capacity Cycle is determined to be A\$156,907.02 which is rounded to:

MRCP = A\$157,000 per MW per year

A MRCP of A\$157,000 per MW per year is proposed by the IMO. This represents a 4.2% decrease from the 2012 MRCP of \$163,900.

The impact of changes in the input parameters since the 2014/15 MRCP is shown in Table 3 below.

Table 3: Impact of year-on-year changes in input parameters

	Impact (\$)	Impact (%)	MRCP (\$)
2014/15 MRCP			163,900
Escalation factors	+ 400	+ 0.2%	164,300
Power Station costs	- 4,300	- 2.6%	160,000
Margin M	+ 600	+ 0.4%	160,600
Fixed Fuel Cost	+ 2,800	+ 1.7%	163,400
Land Cost	- 100	- 0.1%	163,300
Transmission Cost	+ 600	+ 0.4%	163,900
WACC	- 7,700	- 4.7%	156,200
Fixed O&M	+ 800	+ 0.5%	157,000
Combined impact	- 6,900	- 4.2%	157,000

5. STAKEHOLDER INPUT

5.1 Public Submissions

The IMO published the draft report and supporting documents for the 2013 MRCP on its website and initiated a consultation process on 21 November 2012. The IMO directly advised Rule Participants and other industry stakeholders on this date and published announcements in the West Australian and the Australian Financial Review on 22 November 2012. The submission deadline was 19 December 2012.

During the public consultation period the IMO received responses from:

- Community Electricity;
- Verve Energy;
- Perth Energy;
- Merredin Energy; and
- Alinta Energy.

A copy of each submission can be found at <http://www.imowa.com.au/mrcp>. A summary of issues raised in submissions and IMO responses is given in the following pages.

Perth Energy and Merredin Energy raised a number of issues that are outside the scope of this annual review of the MRCP, including:

- A suggestion that the MRCP is being used to address the current excess of capacity;
- The formula for calculating the Reserve Capacity Price (RCP), including the potential removal of the 15% discount that currently applies;
- Performance requirements for DSM;
- The assignment of Capacity Credits to Facilities with high outage rates;
- The accuracy of demand forecasts; and
- Incentives for dual-fuel Facilities.

As these issues are outside the scope of this review, they are not included in the table below. However, in response to these issues the IMO notes that:

- The MRCP is determined in accordance with the Market Procedure, without regard for the capacity supply-demand position in the WEM.
- The Reserve Capacity Mechanism Working Group (RCMWG) is considering revisions to the RCP formula that would make it more responsive to the supply-demand position and address existing distortions that discourage bilateral contracting. The current proposal would remove the current 15% discount and allow the administered RCP to go above the MRCP as the supply-demand balance tightens. More information on the proceedings of the RCMWG is available at <http://www.imowa.com.au/rcmwg>.

- The RCMWG has reached agreement on a set of proposals to harmonise the treatment of demand-side and supply-side capacity resources by significantly increasing the minimum availability requirements for Demand Side Programmes.
- The ERA highlighted the issue of Facilities with high outage rates in its *Discussion Paper: 2012 Wholesale Electricity Market Report to the Minister for Energy*¹⁹. The IMO will be reviewing clauses 4.11.1(h) and 4.27 of the Market Rules in early 2013 and will consider the views from submissions to the ERA's Discussion Paper.
- The IMO recently completed the five-yearly review of the SWIS forecasting processes, including independent analysis and recommendations by ACIL Tasman. The IMO will progress the recommendations from this review during 2013.
- The IMO had previously recommended a design concept to the Office of Energy in early 2011 for an incentive mechanism for dual-fuelled facilities. In addition, the *Energy2031 Strategic Energy Initiative Directions Paper*²⁰ proposed the development of incentives for investment in dual-fuel electricity generation facilities. However, the Market Advisory Committee was advised in August 2012 that "*the Public Utilities Office (PUO) had considered the dual fuel issue further and concluded that the market had moved on in various ways since the initial recommendations relating to dual fuel were made*"²¹. The IMO also notes that incentives for dual-fuel facilities are not considered in the *Strategic Energy Initiative Energy2031 Final Report*²².

¹⁹ Available at <http://www.erawa.com.au/markets/electricity-markets/annual-wholesale-electricity-market-report-to-the-minister-for-energy/>

²⁰ Available at http://www.finance.wa.gov.au/cms/uploadedFiles/Public_Utility_Office/WAs_Energy_Future/Strategic+Energy+Initiative+Directions+Paper_web.pdf

²¹ Extract from meeting minutes, available at http://www.imowa.com.au/mac_52

²² Available at http://www.finance.wa.gov.au/cms/uploadedFiles/Public_Utility_Office/WAs_Energy_Future/Strategic_Energy_Initiative_Energy2031_Final_Paper.pdf

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
1	Community Electricity	General	We expressly support the manner in which the Market Procedure: Maximum Reserve Capacity Price has been applied.	The IMO notes Community Electricity's support.
2	Community Electricity	Historical variation of the MRCP	We note and support the IMO's commentary to the effect that the Maximum Reserve Capacity Price has been relatively stable since market commencement with the exception of two consecutive extremes caused by a sub-optimal procedure for determining transmission connection costs, which has now been superseded. We consider that the two extreme valuations have created the erroneous perception of a substantial fall in the Maximum Reserve Capacity Price in recent years, while it was actually the former substantial increase that was erroneous. On this basis, we support the pricing outcome of the present review as being appropriately contiguous with historical valuations, especially having regard to matters such as bond yields and the value of the Australian dollar.	The IMO notes Community Electricity's support.
3	Perth Energy	Historical variation of the MRCP	From our own experience of providing capacity in the WEM, PE believes that investment capital will not be attracted to providing peaking plant (within a 2-3 year capacity cycle) unless the price for capacity is relatively predictable. It is unlikely that investors will commit to 20 year investment decisions based on the low WACC and inherent uncertainty and lack of commercial rationale in MRCP/RCP determination. Our view is the current situation will likely jeopardise the provision of new generation capacity in the future. As a retailer this is of significant worry to us as it could reconcentrate the supply side to the detriment of consumers.	The IMO considers that the MRCP has been relatively stable aside from the MRCPs for 2012/13 and 2013/14, which are outliers. As described in the Executive Summary of this report the higher MRCPs for 2012/13 and 2013/14 were largely driven by higher estimates of Transmission Costs from Western Power that were not reflective of the capital contributions actually being charged to generation project developers.
4	Merredin Energy	Margin M	SKM's estimate of construction insurance costs has not been updated and remains inadequate at 0.4%. The IMO, in its report on annual insurance costs, noted insurance premiums had increased 22.5%. It is disappointing that had not	As stated in its report, SKM had used an unchanged rate for construction insurance from that used in the 2012 MRCP. The IMO has discussed this issue with SKM and

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
			<p>identified by SKM as an issue prior to its report having been released. It may be sensible for construction insurance costs to be separately estimated as a MRCP parameter rather than being assessed by SKM and rolled into the M factor.</p> <p>The construction insurance costs need to be amended to reflect current market rates. Furthermore, the extent of cover needs to be analysed and disclosed. Importantly, because of the capacity credit refund regime, construction insurance needs to cover consequential losses of 24 months for capacity credits refund liabilities (consistent with the approach applied to operational business interruption insurance) to cover loss events during construction that lead to subsequent capacity credit refunds.</p> <p>Merredin Energy had to take out the following insurance cover during construction:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Construction Material Damage <input type="checkbox"/> Construction Advanced Business Interruption <input type="checkbox"/> Construction Liability (General and Products Liability) <input type="checkbox"/> Construction Marine Cargo & Marine Advanced Business Interruption <input type="checkbox"/> Directors and Officers Liability Cover <p>Merredin Energy's insurance premiums totalled \$600,000 in our first year of construction. This represented around 0.8% of the EPC contract sum, prior to the 22.5% increase in premiums recently experienced. Based on our calculations, the insurance margin should be at least 1.0%.</p>	<p>considers it appropriate that the increase in insurance costs also be reflected in the construction insurance costs in margin M. This is reflected in the letter from SKM dated 2 January 2013, indicating that it has increased the allowance from 0.4% to 0.5%.</p> <p>The IMO considers it likely that the risk of refund liabilities due to delays in the completion of construction would be managed in the EPC contract for such a facility.</p> <p>The IMO notes that the MRCP is based on a theoretical power station and may not reflect the specific risks and circumstances of individual projects. As the MRCP reflects the marginal cost of entry of new capacity, the IMO considers it inappropriate to include corporate overhead costs that may be associated with a single-asset company.</p> <p>The IMO also notes that the Margin M also includes a substantial allowance of 5% for Contingencies.</p>
5	Perth Energy	Transmission connection cost	Transmission network connection costs continue to be unpredictable, depending mainly on the location a new project happens to be, and a significant contributor to the overall level of the MRCP. By using an average cost over the	The previous methodology employed by Western Power for 2012/13 and 2013/14 for estimating Transmission Connection Costs resulted in costs that were not reflective of the actual capital

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
			last 6 years this major input by definition is not a maximum. It would be better for IMO to take an average of the likely locations for generation capacity development as provided by Western Power (WP). At least this is forward looking, with WP recommending where the lowest cost locations are for a nominal peaking plant to connect to the Grid.	contributions being charged to project developers. The current methodology, first used for 2014/15, is based on a weighted average of actual capital contribution costs charged by Western Power to project developers.
6	Perth Energy	Transmission connection cost	PE would prefer to see a transmission connection cost methodology that reflects the location (and degree of constraint present) of the connection on the network and the type of load to be supplied. Such a change would see the connection costs charged to those users servicing the market as a whole being 'use of system' charges while those servicing special discrete loads would be charged on more of a user-pays, deeper connection, cost.	The current Transmission Connection Cost methodology is based on actual generation projects and thus takes account of the location and constraints applicable to actual projects. The methodology excludes generators where "the significant driver for the location of the facility is ... the need to embed the generation with a load (electrical or heat)" (step 2.4.1 of the Market Procedure. Such a generator may face increased connection costs that are not reflective of the costs for an efficient new entrant peaking generator. Further, the IMO considers it likely that a facility developed to serve a special discrete load would be bilaterally contracted with that load and hence would be unlikely to offer into a Reserve Capacity Auction.
7	Merredin Energy	Fixed Costs Fuel	In order to achieve practical completion and reserve capacity certification, a new power generator needs to complete successfully a series of commissioning tests to meet System Management requirements. This include 'cold commissioning' prior to the connection to the Western Power network and 'hot commissioning' which involves the dispatch of power to the grid. Merredin Energy consumed \$2m worth of diesel fuel to comply with the minimum Western Power testing requirements for commissioning our 82MW plant. For a	The IMO notes that the MRCP is based on a theoretical power station and may not reflect the specific risks and circumstances of individual projects. The IMO has consulted with System Management, which is responsible for managing the interaction between the system and a commissioning generator. System Management has advised that it is common practice for the tests required by Western Power to be conducted in conjunction with

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
			<p>160MW power station, the fuel costs would have totalled \$4m.</p> <p>As a result of the IMO's capacity credit timetable, the majority of our commissioning had to be undertaken during the months of August and September, when energy prices are typically low. Merredin Energy earned a negligible \$27,000 in STEM revenues from the generation of power during hot commissioning over the 2012 winter/spring period. The net fuel costs associated with commissioning had been ignored by SKM in its estimate of fixed fuel.</p> <p>The fixed fuel costs should increase by \$4.0m for the notional 160MW power station.</p>	<p>the commissioning that is required under a typical EPC contract.</p> <p>The IMO notes that SKM has included a 2% allowance within Margin M for Start-up costs to cover costs including "<i>fuel and consumables used in testing and commissioning</i>". SKM's estimate is based on SKM's expertise from a range of projects with varying characteristics.</p> <p>Based on this information, the IMO considers that the allowance for Start-up costs is appropriate to cover the cost of fuel during commissioning.</p> <p>The IMO notes that the Reserve Capacity Mechanism places no limitations on the timing for plant commissioning. In the case of Merredin Energy, the Reserve Capacity Obligations for its Facility may have commenced at any time from 1 June to 1 October 2012, subject to the completion of commissioning.</p>
8	Perth Energy	WACC	The current WACC methodology is inconsistent with investors' expectations of the risks involved in building and operating generation plant – we have attached a paper dealing comprehensively with issues associated with WACC determination and hope the IMO will be considering it appropriately.	The IMO considers that it is appropriate to determine the WACC in a way that is consistent with currently accepted Australian regulatory practice. Please refer to Section 3.6.2 of the Final Report for the 2014/15 MRCP for additional details.
9	Perth Energy	WACC	The effectiveness of the Reserve Capacity Price set using the administrative formula in the Market Rules is impaired by the approach adopted by the IMO to calculating WACC for the MRCP. The Capital Asset Pricing Model used by the IMO, if applied appropriately and calibrated against wider evidence, has the potential to be effective. However the approach currently adopted by the IMO does not meet	<p>The IMO notes that it is standard regulatory practice in Australia to determine the WACC using the CAPM. See also response 8 above for additional detail.</p> <p>As noted in Section 5.1 of this report, the IMO considers that the formula for calculating the Reserve Capacity Price can be improved to deliver</p>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
			<p>Market Objectives of:</p> <ul style="list-style-type: none"> • promoting the economically efficient, safe and reliable production and supply of electricity and electricity related services in the SWIS; and • encouraging competition among generators and retailers in the SWIS, including by facilitating efficient entry of new competitors; <p>because the WACC and MRCP that result from the IMO's approach:</p> <ul style="list-style-type: none"> • does not result in an economically efficient price for the efficient, safe and reliable production and supply of electricity services in the SWIS; and • consequently does not provide pricing that facilitates efficient market entry and hence competition in the generation sector. 	<p>a more economically efficient capacity price and to send a sharper signal to investors when new capacity is required. Amendments to the RCP, in part to address this issue, are currently being considered by the RCMWG.</p>
10	Perth Energy	WACC	<p>The IMO sought advice from PriceWaterhouseCoopers (PwC) to inform its determination of WACC parameters. However, the terms of reference for advice it provided to PwC restricted the research to three WACC parameters and to regulatory decisions made by regulators subject to merit reviews. Accordingly, PwC was obliged to ignore regulatory decisions made by other economic regulators which may be appropriate to consider in the context of the decision on the MRCP. It seems important that the IMO should consider all information to ensure that the decision making approach is appropriate for the MRCP.</p>	<p>The Market Procedure obliges the IMO to “determine the methodology to estimate the DRP, which in the opinion of the IMO is consistent with current Australian accepted regulatory practice.”</p> <p>PwC applied the same principle in its 5-yearly review of the WACC parameters, completed in 2011.</p> <p>As described in Appendix B of the Final Report for the 2014/15 MRCP, the IMO places emphasis on the acceptance of various methodologies. The IMO considers that a methodology is accepted if it has been challenged and the application of that methodology has been upheld. For this reason the IMO requested that PwC only consider regulatory decisions that were reviewable by the ACT when preparing its paper for presentation to the</p>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
				<p>stakeholder workshop held on 1 November 2012.</p> <p>The IMO notes that it requested PwC to consider the cost of debt, the risk free rate and gamma for its recent paper for the stakeholder workshop. The IMO did not request new advice on other parameters as the 5-yearly review was completed in 2011 and no sustained shift in regulatory practice has been observed in relation to those parameters.</p>
11	Perth Energy	WACC	<p>The IMO approach includes parameter values carried over from previous reviews as well as parameters that are recalculated annually. Although, perhaps inconsistently with this approach, one of these “fixed” parameters, the gamma, was reviewed by PwC in its report due to a recent Australian Competition Tribunal (ACT) decision, which changed the value used by other Australian regulators.</p> <p>In particular, members of certain pairs of WACC parameters are interrelated. One member of the pair does not operate independently of the other. However, for two of the pairs, the IMO's approach holds the risk of internal inconsistency in its calculation of WACC because one member of a pair is updated and the other is not:</p> <ul style="list-style-type: none"> • the risk free rate (updated annually by IMO) and the market risk premium (updated by IMO every five years); and • the debt risk premium (updated annually by IMO) and debt issuance costs (updated by IMO every five years). 	<p>The frequency of review of WACC parameters is stipulated in the Market Procedure. However the IMO considered it appropriate to propose an amendment to the value of gamma due to the ACT decision²³ and consistent use of a gamma value of 0.25 in subsequent regulatory decisions by the AER and the ERA.</p> <p>In its Final Distribution Determination, Aurora Energy Pty Ltd, 2012-13 to 2016-17 (April 2012), the AER stated that it “<i>considers that is incorrect to characterise the method for calculating these WACC parameters as a long term historical MRP coupled with a short term risk free rate. The risk free rate is not 'short term'. The risk free rate and MRP are both reflective of a forward looking return over the next 10 years. However, there are different considerations and evidence available for each parameter. The approach adopted by the AER is therefore internally consistent.</i>” The IMO supports this view.</p> <p>The IMO notes that a debt issuance cost allowance</p>

²³ Application by Energex Limited (Gamma) (No 5) [2011] A CompT 9 (12 May 2011)

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				of 12.5 basis points has been standard Australian regulatory practice since before the 2007 review of WACC parameters conducted for the IMO by the Allen Consulting Group. For this reason PwC recommended in its 5-yearly review that this parameter be updated once every five years.
12	Merredin Energy	WACC	The IMO has reviewed only some of the existing WACC parameters, such as the gamma. It is poor public policy for the IMO to make judgement calls on which parameters to review and when. Best practice would see the IMO publish guidelines on that point. This would reduce the subjectivity present in the application of the current market procedures.	Please see response 11 above. The IMO notes that any amendment to the 5-Yearly WACC parameters may only be made through the Procedure Change Process, which includes public consultation.
13	Perth Energy	WACC	The IMO's approach focuses heavily on the WACC parameters, but not on the resulting WACC. WACC parameters are an input to a pricing outcome, not the outcome itself. The resulting WACC should be calibrated against expectations of industry norms and the objectives of the pricing regime, to help check test all the parameters are appropriate. For example, regulators in the United Kingdom and IPART commonly use financeability tests to determine whether the rate of return outcomes from the CAPM are consistent with regulators' obligations to balance the interest of investors and customers and to maintain the financial viability of regulated businesses. A financeability test examines the future cash flows that result from rate of return decisions and tests whether they enable a business to meet the regulator's assumed or target credit ratings and key financial ratios that measure financial viability and health. IPART has recently reaffirmed its commitment to using these tests as part of its approach to regulation going forward.	The IMO acknowledges that different regulators may follow different approaches in this area. Please see also response 10 above.

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14	Perth Energy	WACC	<p>The CAPM is a widely accepted technique for calculating a benchmark rate of return for a business. While it is commonly used by access regulators to calculate regulated rates of return for monopoly businesses, there is no constraint on the use of CAPM for such businesses.</p> <p>The calculation of a WACC under the CAPM requires a range of specific input parameters to the CAPM to be determined.</p> <p>However, in deriving the input parameters for the WACC for the MRCP, the IMO has:</p> <ul style="list-style-type: none"> referred to regulatory precedents that apply to access regulated monopoly industries and services; and drawn heavily on parameters and precedents applicable to network businesses. <p>This does not appear appropriate or rational because:</p> <ul style="list-style-type: none"> reserve capacity is provided by the generation sector which normally operates in competitive markets. Precedents provided by commercial and market practice, not regulatory practice would be applicable; and the operational and investment risks of generation businesses are significantly different to network businesses and revenue capped network businesses in particular. For example, generation businesses are subject to fuel price and supply risk and risks of competition and significantly greater volatility in demand and price. 	<p>The IMO agrees that the CAPM is widely used by regulators to calculate rates of return.</p> <p>The CAPM contains a mixture of market-wide parameters and industry-specific parameters. Further details can be found in PwC's 2011 report on the WACC for the MRCPWG²⁴.</p> <p>Values for the industry-specific parameters are set to reflect common financing practices and to estimate the relative risks for a benchmark entity in the electricity generation industry. These parameters are the gearing ratio, credit rating (which is important in estimating the cost of debt) and beta.</p> <p>The IMO notes that it has applied different values for these industry-specific parameters than have been applied for electricity network businesses. For example Western Power's 2013-17 access arrangement uses a lower beta, higher gearing ratio and higher credit rating than are used for the MRCP.</p>
15	Perth Energy	WACC	The IMO sets the price of generation capacity, not	See responses 10 and 14 above.

²⁴ Available at <http://www.imowa.com.au/mrcpwg>

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			transmission and distribution network services. The MRCP prices a fundamentally different service. Given the nature of the prices being regulated by the IMO, there may be some benefit in considering a wider pool of regulatory precedents in evaluating the appropriate level of the MRCP. For example, the IMO does not appear to have considered taking into account regulatory precedents for WACC for retailers, for regulated retail tariffs whose participation in wholesale electricity markets would indicate a risk profile closer to a generation business, than a network business. Examples include IPART's review of retail electricity tariffs in 2010 where it considered WACC for a retailer and a generator, and market observations on some WACC parameters for listed companies in Australia operating in the generation sector.	
16	Alinta Energy	WACC	<p>Alinta continues to consider that a 'significant economic event' has occurred since PricewaterhouseCoopers (PwC) finalised its advice to the IMO and MRCP Working Group (MRCPWG) in February 2011 on the Weighted Average Cost of Capital (WACC) methodology. If anything, the evidence of a significant economic event is best illustrated by the recent market observations related to actual returns across a broad spectrum of securities. In particular there is a significant divergence between the rates for risky and non-risky assets in Australia;</p> <ul style="list-style-type: none"> • Riskless securities such as government bonds have an artificially low rate as a result of foreign investors demand outstripping current supply; while • Risky assets such as bank debt have experienced an increasing cost of financing, as is evidence by the increased spread between bank borrowing and lending costs. <p>Consequently, Alinta continues to request the IMO to exercise its discretion under the Market Procedure for the</p>	<p>The Market Procedure allows the IMO to 'review and determine values for the 5 Yearly components that differ from those in step 2.9.8 if, in the IMO's opinion, a significant economic event has occurred since undertaking the last 5 yearly review of the Maximum Reserve Capacity Price'.</p> <p>In section 3.6.3 of the Final Report for the 2014/15 MRCP, the IMO concluded that no significant economic event had occurred since the completion of the last 5-yearly review finalised in October 2011. Since that time there has been little change in the key Australian economic indicators that were considered at that time (GDP, CPI, the AUD-USD exchange rate and unemployment rate) and the ASX200 index has risen by 15% since the end of 2011.</p> <p>The IMO does not consider that there is compelling evidence to suggest that there has been a 'significant economic event' since the last review</p>

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			determination of the Maximum Reserve Capacity Price (the Market Procedure) and re-examine the appropriateness of the prescribed five year values for the market risk premium (MRP) and equity beta used to calculate the WACC.	was completed in 2011.
17	Perth Energy	WACC – Risk Free Rate	<p>The IMO has noted that its stakeholders consider that the current depressed values for the risk free rate is more a product of market characteristics (a flight to safety) than an appropriate estimate of the risk free rate that should be applied in the calculation of the WACC. PE considers there to be considerable support for a more long term approach to estimating the risk free rate under current market conditions. This support includes precedent and a recent Australian Competition Tribunal (ACT) decision, Application by EnergyAustralia and Others (No 2) [2009] ACompT9.</p> <p>In the ACT's decision, EnergyAustralia proposed an averaging period for determining the risk free rate that 'is closest to the regulatory control period prior to the emergence of the marked acceleration of the global financial crisis in September 2008'. This period was proposed on the basis that:</p> <ul style="list-style-type: none"> • the AER's specified averaging period for observing key financial data is highly likely to include data that has been impacted by this supervening critical event; and • 'an averaging period affected by the current abnormal financial market conditions will provide an estimate of the rate of return ... which is materially biased below the rate of return required by investors in a similar commercial business'. <p>The ACT upheld EnergyAustralia's appeal, and the averaging period proposed by EnergyAustralia was used in its final determination.</p>	<p>The IMO notes that Perth Energy has referred to a single decision by the ACT in 2009. However standard practice by the AER and ERA since that time has been to use a recent averaging period, typically being the last 20 business days of the preceding calendar month.</p> <p>The IMO will continue to monitor regulatory practice with regard to the selection of the averaging period for calculating the risk free rate.</p> <p>See also response 11 above.</p>

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18	Perth Energy	WACC – Risk Free Rate	<p>A further precedent for calculating the risk free rate which addresses this volatility is provided by SA Water in its recent pricing proposal, which proposed a 180 day observation period to average out the outliers and extend the sample size. In particular, SA Water mentioned that:</p> <ul style="list-style-type: none"> • actual financing costs may differ significantly from those estimated under a 20 day averaging period; and • the 20 day averaging period does not take into account the potential variability in debt market conditions over the regulatory period. <p>In the SA Water example, a 180 day averaging period to 1 June 2012 for a 10 year Commonwealth Government Bond provided a nominal risk free rate of 3.93 per cent.</p>	<p>The IMO notes that ESCOSA has yet to issue its draft decision in relation to SA Water's proposal. However, in its public consultation issues paper²⁵ ESCOSA states that its "preference is to use a 20 day averaging period".</p>
19	Alinta Energy	WACC – Risk Free Rate	<p>Alinta is concerned that the application of the risk free rate based on the current abnormally low yield on ten year Commonwealth Government bonds does not reflect the true risk free rate but rather is inappropriately depressed compared with its long run average value. Additionally, Alinta notes that once committed the development of generation assets are naturally long term investment decisions (30-40years). The development of an asset such as a power station is very costly and requires significant uncertainty of returns. Investors traditionally look to the capacity price to provide this certainty given the restrictions on bidding in the energy market (i.e. price caps and SRMC bidding requirements).</p> <p>Alinta continues to request to request that the IMO seek advice from an economic consultant to confirm whether:</p>	<p>The AER considered this issue in its <i>Final Distribution Determination, Aurora Energy Pty Ltd, 2012-13 to 2016-17</i> (April 2012) expressing their view that at "times of uncertainty, investors are prepared to accept a lower yield on relatively safe assets". The AER went on to state that "an alternative explanation might be that CGS are currently 'over priced', in the sense that the price of CGS exceeds its fair value, and therefore the yield is 'artificially low', For the AER to make such a conclusion, the AER would, effectively, be saying that it has better information than the market or that it 'knows better' than the many traders in the market whose interactions set the price of CGS. The AER considers there is not a reasonable basis to draw such a conclusion on the evidence before it." The</p>

²⁵ Review of SA Water's Regulatory Business Proposal for the Revenue Determination Period 2013/14-2015/16, Public Consultation – Issues Paper, October 2012

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			<ul style="list-style-type: none"> Global structural imbalances have created an excess demand for Commonwealth Government Bonds which have subdued their observed price, thereby justifying an adjustment to the risk free rate; and Longer term, the observed yield on government bond remains an acceptable proxy measure of the risk free rate. 	IMO supports this view.
20	Perth Energy	WACC Inflation	– Perth Energy notes that the inflation is set at 2.57 per cent which is close to the mid point in the Reserve Bank of Australia target range of 2 per cent to 3 per cent. This is likely to be close to the outturn inflation rate due to the Reserve Bank's actions on adjusting interest rates. The forecast inflation rate is consistent with generally accepted economic forecasts.	The IMO notes Perth Energy's submission.
21	Perth Energy	WACC Market Risk Premium (MRP)	– In the past, Australian regulators consistently applied a market risk premium of 6 per cent. However, in its 2009 review of WACC parameters, the AER concluded that the market risk premium should be increased to 6.5 per cent on the basis of market conditions at the time. Nevertheless in its final decision on Envestra's access arrangement proposal for the South Australian gas network, released in February 2011, the AER used a market risk premium of 6 per cent for the gas business. In the ElectraNet draft decision (November 2012), the market risk premium was set at 6.5 per cent, consistent with the AER WACC review of May 2009, and consistent with ElectraNet's proposal. Murraylink, a single asset transmission interconnector also received a draft decision in November 2012 with an MRP of 6.5 per cent. This is consistent with 6.5 per cent allowed for ETSA Utilities more than two years ago in 2010. These decisions reflect the regulator's view that current market conditions remain inconsistent with normal, longer term market conditions and that a higher MRP is	<p>The MRP of 6% used in the MRCP is stipulated in the Market Procedure.</p> <p>In the 5-yearly review of WACC parameters completed in 2011, PwC recommended <i>"a value of the MRP of 6.0 per cent taking into account an emerging regulatory position for a reversion to a long-standing position of adopting an MRP of 6.0 per cent after contemplating a higher value of 6.5 per cent for a period during and after the global financial crisis"</i>.</p> <p>The IMO notes the recent AER decisions quoted by Perth Energy. The IMO also notes however that:</p> <ul style="list-style-type: none"> a MRP of 6% has been used in many AER decisions during 2012 including for SP Ausnet, the Roma to Brisbane Pipeline and Aurora; the ERA has applied a MRP of 6% in its decisions for WAGN, the Dampier to Bunbury

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			warranted.	<p>Pipeline and for Western Power; and</p> <ul style="list-style-type: none"> the ACT upheld an MRP of 6% in January 2012 in the application by Envestra Ltd for its SA and QLD gas networks. <p>Consequently, the IMO does not consider that a sustained shift in regulatory practice has occurred in relation to the MRP. The IMO will continue to monitor regulatory practice and will develop a Procedure Change Proposal if a sustained shift in regulatory practice is observed. This is consistent with the IMO's approach to gamma in 2012.</p>
22	Perth Energy	WACC Market Premium (MRP) – Risk	PE submits that the MRP should represent that component that, when applied in a CAPM, offers sufficient incentive for an investor to make efficient investment in new generation capacity in the WEM. Whilst PE acknowledges that the MRP is not business dependent, it seems difficult to understand how a more risky business operating in more difficult times might be fairly treated by an MRP which was less than that applied in a network business.	<p>The IMO disagrees with Perth Energy's suggestion that the MRP should be set at a level so as to offer <i>"sufficient incentive for an investor to make efficient investment in new generation capacity in the WEM"</i>.</p> <p>As Perth Energy noted in its submission, the MRP is a market-wide parameter that estimates the return that an investor requires above the risk free rate in order to accept average market risk.</p> <p>Please also refer to response 21 above.</p>
23	Alinta Energy	WACC Market Premium (MRP) – Risk	Given PwC's comments (noted above), it reasonably follows that investors expected MRP will also have increased from 6% given the occurrence of a "significant economic event" resulting in greater levels of investment uncertainty. Alinta notes that other electricity regulators have applied higher MRP's in recent years. In particular, following its 2009 review of the WACC parameters the Australian Energy Regulator (AER) has been applying a MRP of 6.5% to transmission and distribution network determinations as reflected in its guideline document. This includes for recent draft determinations such as Electranet and Murraylink. Alinta notes that the AER adopted a value of 6.5% "having regard	See responses 16 and 21 above.

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			<p>to the desirability of certainty and stability”.</p> <p>Alinta recommends that in light of continued market evidence of a “significant economic event” having occurred and given that regulatory precedent of the AER, the IMO should consider adopt a MRP of 6.5%, as is applied by other regulators would be appropriate for determining the MRCP.</p>	
24	Merredin Energy	WACC – Market Risk Premium (MRP)	<p>We note PwC’s advice to the IMO dated 19 October 2012 titled <i>Re: Summary of regulatory decisions related to Reserve Capacity Price</i> discussed the equity market risk premium (EMRP). Professor Robert Officer was quoted by PwC in that report, where Officer had made some good points in relation to the EMRP. We understand from PwC’s correspondence that it agrees with Officer’s stated position, particularly in respect of the risk free rate and EMRP needing to be set using consistent timeframes (either point in time or ‘normalised levels’). Contrary to that advice, the current approach is uses inconsistent time periods, with normalised betas and EMRPs but a point in time parameter for the risk free rate. We suggest a review of the asset beta and EMRP is warranted immediately and prior to finalising the 2015-16 MRCP, particularly as the risk free methodology can not be changed barring an amendment to the market procedures.</p> <p>Given PwC’s advice, who were engaged as an expert adviser to the IMO, the IMO should be duty bound to consider and act on that advice of 19 October. Such action should result in a higher and more appropriate EMRP. The recent academic paper <i>Adjusting the Market Risk Premium to Reflect the Global Financial Crisis</i> by Bishop, Fitzsimmons and Officer published in FINSIA’s Journal of Applied Finance JASSA Issue 1 2011 found the market risk premium to be 9.7% based on the prevailing market volatility at the time of publication. Recognising the movement in markets since that</p>	Please see responses 11 and 21 above.

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			date, an EMRP around 7% would be realistic today.	
25	Community Electricity	WACC – Debt Risk Premium (DRP)	<p>We note the discussion of the relative merits of assessing the Weighted Average Cost of Capital via the cost of bank debt rather than through the corporate bond market. We support the continued use of the corporate bond approach on the grounds that it is the role of the IMO to follow established regulatory practice on such matters and no Australian regulator has used the cost of bank debt approach. It should also be remembered that:</p> <ul style="list-style-type: none"> • the IMO's determination of the Maximum Reserve Capacity Price is subject to review by the ERA; • the Maximum Reserve Capacity Price is an estimate of the marginal cost of entry of additional Reserve Capacity in the applicable Capacity Year. While it is based on a benchmark power station, such a station probably does not exist in practice in respect of all elements and nuances of the benchmark. It is therefore necessary to assess the integrated package represented by the benchmark, and it is generally not appropriate to isolate for review particular aspects of it on a stand-alone basis without consideration of the interrelatedness with other aspects. [That said, we consider resetting the 'gamma' to be an exception as this is a supposedly fixed parameter in an accounting equation.] 	The IMO notes Community Electricity's support.
26	Community Electricity	WACC – Debt Risk Premium (DRP)	We expressly support the application of the ERA's Bond Yield approach to determining the Debt Risk Premium component of the Weighted Average Cost of Capital.	The IMO notes Community Electricity's support.
27	Alinta Energy	WACC – Debt Risk Premium (DRP)	Alinta supports the use of the ERA's bond yield approach for the purposes of determining a WACC for an electricity generation business. However, Alinta considers that using an	The IMO notes Alinta's support for the use of the "Bond-Yield Approach" in determining the DRP. In the Draft Report for the 2015/16 MRCP the IMO

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			investment grade rating of BBB+ is inappropriate for generators in the WEM. The debt levels and riskiness of servicing that debt for electricity generators is significantly greater than for network generation businesses. Further, during the past few years' significant financial problems have been experienced by a number of the Market Generators in the WEM. Given recent experience Alinta questions whether any generators in the WEM (and more broadly Australia) currently have a BBB+ investment grade rating (or even a BBB investment grade rating). Alinta requests the IMO to undertake an assessment of the ratings of independently owned electricity generators in Australia to confirm an appropriate investment grade to be used for the purposes of the ERA's bond yield approach.	<p>applied the "Bond-Yield Approach" as calculated by bonds with a credit rating of BBB and BBB+. This represented a strict application of the ERA's approach in the WAGN final revised decision.</p> <p>However, Step 2.9.7(h) of the Market Procedure requires the DRP to be determined from "<i>the observed annualised yields of Australian corporate bonds which have a BBB (or equivalent) credit rating</i>".</p> <p>Consequently the IMO has applied the "Bond-Yield Approach" as calculated from bonds with a BBB rating only in this Final Report.</p>
28	Perth Energy	WACC – Debt Risk Premium (DRP)	The regulatory approaches reviewed by PwC for the IMO consider the debt risk premium for network businesses. This is not appropriate for the MRCP because it is required to reflect the cost of providing reserve generation capacity rather than a monopoly network system.	<p>The methodologies examined by PwC have estimated the debt risk premium from observations of corporate bond yields of a particular benchmark credit rating.</p> <p>As noted in the advice from PwC²⁶ the DRP has been calculated from observed yields of a selection of corporate bonds with a credit rating of BBB with a term to maturity of at least 2 years. Table 2 in PwC's letter shows that the selected bonds have been issued by a range of companies in various industries including gas pipelines, airports, cement and property.</p>
29	Perth Energy	WACC – Debt Risk Premium (DRP)	In addition, the IMO's Draft Determination notes that stakeholders have suggested that they are more likely to access bank financing rather than corporate debt market	In its review for the stakeholder workshop held on 1 November 2012, PwC stated that " <i>with respect to the issue of assessing the cost of bank debt, we</i>

²⁶ http://www.imowa.com.au/f175,3075586/20121011_IMO_-_PwC_Debt_risk_premium_Final.pdf

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			<p>financing. In network price regulation, debt market financing is used because it is assumed that the regulated businesses have access to these markets. It would be reasonable to assume that network businesses would have access to debt markets. However, it may not be axiomatic that this is also true for a less capital intensive business such as a benchmark provider of Reserve Capacity. There are regulatory precedents for this, which appear more relevant than the large network business precedents on which the IMO has drawn. It would be appropriate for the IMO to consider this matter and its impact on the debt risk premium.</p>	<p><i>note that as far as we are aware, no Australian regulator has applied a cost of debt estimate that is based on a measure of the cost of bank debt.</i></p> <p>The IMO notes that BBB is the lowest credit rating that is considered "investment grade".</p> <p>In addition to the review by PwC, the IMO separately consulted with banks to determine whether banks maintained a robust benchmark or index of the cost of debt that was publicly available. The banks contacted confirmed that the cost of bank debt was determined on a project-by-project basis and that no such benchmark was publicly available.</p>
30	Perth Energy	WACC – Debt Issuance Costs	<p>While using a consistent level for some parameters over time is a well accepted approach to price regulation (for example, the market risk premium is often kept stable over time by regulators), it seems reasonable to question whether debt issuance costs should be left fixed while the debt risk premium is calculated annually. In times of uncertainty, the costs of issuing debt can vary. This may coincide with large changes in the debt risk premium. Given the potential for debt issuance costs to vary, there may be a benefit in calculating the debt.</p>	<p>See response 11 above.</p>
31	Community Electricity	WACC Gamma	<p>- We expressly support resetting the imputation credit ("gamma") value to 0.25 in line with current Australian regulatory practice.</p>	<p>The IMO notes Community Electricity's support.</p>
32	Perth Energy	WACC Gamma	<p>- PE submits that the move from a gamma of 0.5 to 0.25 recognises that there are different investors participating in the market and that international investors and others do not value franking credits in the same way as an Australian</p>	<p>The financing parameters used within the WACC are based on the assumption that finance is sourced within Australia. This is consistent with the use of Australian benchmarks for other WACC</p>

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			<p>resident taxpayer. The adoption of a gamma of 0.25 in the Australian Competition Tribunal decision recognises the reduction in value of franking credits attributed to a mix of equity providers. It is noted that there are many instances of Australian generation businesses with foreign ownership to support the notion that franking credits should be valued at the lower end of the scale.</p> <p>Given that the generation sector is more likely to need foreign investment to satisfy the equity needs for a new generation project, the gamma should be zero, or at least approach zero to offer sufficient incentive to maintain access to the necessary capital and provide benefits of competition in the WA generation market.</p>	<p>parameters including the risk free rate, inflation, Debt Risk premium and the Corporate tax rate.</p> <p>It is not Australian regulatory practice to determine WACC parameters on the assumption that finance is obtained outside of Australia.</p>
33	Perth Energy	WACC – Beta	<p>In its 2009 WACC Review (for network businesses), the AER changed its previously held position on the value of the equity beta for electricity distribution and transmission businesses from 1.0 to 0.8.</p> <p>Because the AER WACC review sets some parameters for a period until the next WACC review, the equity beta applied in the recent ElectraNet draft decision was 0.8 (November 2012). This was applied to a business with approximately \$2 billion in assets, operating a monopoly transmission business under a revenue cap approach. This is therefore a significantly less risky business with more stable revenue streams than a generation business supply reserve capacity.</p> <p>The question of whether it is appropriate to use the equity beta applied to distribution and transmission businesses in a process to determine an MRCP in WA depends on an assessment of whether there is a difference in the systemic risk faced by network monopolies as compared to generation businesses. Reasons for any differences are primarily due to the nature of activities undertaken by the businesses and the</p>	<p>The beta used in the MRCP is stipulated in the Market Procedure.</p> <p>The value of beta was assessed by PwC in its 5-yearly review for the MRCPWG, through examination of a wide range of comparator companies in the electricity generation industry. PwC's analysis and recommendation was based on the assumption in Step 2.9.1 of the Market Procedure that the power station "is assumed to receive capacity credits through the Reserve Capacity Auction and be eligible to receive a Long-Term Special Price Arrangement".</p>

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			costs incurred.	
34	Alinta Energy	WACC - Beta	<p>During the past four years electricity generators have experienced far more volatility than the market as a whole. This is evidenced by the recent significant reductions in electricity demand in the eastern states that have occurred in isolation from a reduction in economic growth. Likewise in Western Australia actual demand for energy has not been as high as was originally predicted given that a number of large loads were assumed in the Statement of Opportunities did not eventuate. Other factors resulting in volatility in the WEM include:</p> <ul style="list-style-type: none"> • Significant variations in the Reserve Capacity Price that have created significant concerns for investors around expected returns on both new and existing generation assets; • The impact of a Demand Side Management (DSM) on the Reserve Capacity Price, i.e. significant entry of DSM into the market over the last few years has contributed to an oversupply of capacity; • Significant cost to Market Generators of operating in the new Balancing and Load Following markets; • Increases in the penetration of renewable energy technologies have resulted in reduced overnight prices which have on occasions caused base load facilities to turn off over night and have changed requirements for Ancillary Services; • Uncertainty created by the Rule Change Process; • Lack of investment by the private sector in recent times in the WEM except in joint venture with Government, e.g. Vinalco, Mumbida wind farm, Greenough River Solar Farm. <p>Given the volatility in the operating environment for electricity</p>	See response 33 above.

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			<p>generation assets in Australia and specifically Western Australia, Alinta considers that the current value for the equity beta is inappropriate and resulting in a “non-real world” WACC outcome. Even at the assumed gearing levels, an equity beta of less than one does not adequately reflect the volatility in expected returns and therefore the relative riskiness faced by a standalone generator in Western Australia. An equity beta of less than one may be appropriate for an existing state owned base load generator however the risk profile is significantly greater for a privately funded new entrant electricity generator. As the MRCP based on the development of a new 160MW Open Cycle Gas Turbine, Alinta considers it is appropriate to assume the higher risk profile would apply.</p> <p>While the overall impact on the nominal return on equity is as a result of a combination of parameters, including the risk free rate of return and MRP (both discussed in this submission), Alinta considers that the IMO should engage an economic consultant to re-examine the equity beta given that it does not adequately reflect the riskiness of investment in a generator in the WEM.</p>	
35	Merredin Energy	WACC - Beta	We consider that financiers will be continue to be concerned by the volatility of MRCP changes and this will, in turn, increase the cost of funding. This volatility should feed into the asset beta and the WACC. We note that no justification for retaining an asset beta of 0.5 has been provided. This number was based on dated historical data that is unreflective of the risks associated with constructing and operating a WEM peaking generation plant. We suggest an asset beta should be at least 0.6 based on the analysis presented in our previous submissions to the IMO.	Please see responses 3 and 33 above.
36	Merredin	WACC -	The expected rate of inflation (parameter (i)) should be derived from the difference in nominal and inflation linked	Step 2.9.7(k) of the Market Procedure requires that the value of the inflation parameter be determined

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	Energy	Inflation	bond yields published by the RBA, rather than taking a single one year projection of 3.25% and nine years of 2.5% which is largely an arbitrary assumption. The IMO's existing methodology is inconsistent with the market procedure as the RBA has not published specific inflation forecasts out to 2022. Using RBA published bond yield data for bonds maturing in 2022, without interpretation or extrapolation, would be consistent with the market procedures and give a more sensible expected inflation result. Based on RBA published bond yield data (as underpinned in Graph 5.9 of the RBA's Statement on Monetary Policy November 2012), long term expected inflation (parameter (i)) should be 2.1%.	<p>with "regard to the forecasts of the Reserve Bank of Australia and, beyond the period of any such forecasts, the mid-point of the Reserve Bank's target range of inflation." The IMO considers that it has determined the value of the inflation parameter in accordance with the Market Procedure.</p> <p>The IMO notes that the recent RBA forecasts of CPI inflation are 2-3% for the 2013/14 financial year and the 2014 calendar year²⁷.</p> <p>Analysis in a recent discussion paper published by the RBA²⁸ supports the use of the mid-point of the RBA's target range of inflation for the outer years:</p> <p><i>"At horizons over which monetary policy has a substantial influence, deviations of inflation from the target should generally be unpredictable. If there were predictable deviations, it would mean that the central bank was expecting that it would miss its target and was not acting to prevent this."</i></p>
37	Perth Energy	WACC – Gearing Ratio	The debt to equity ratio assumed by the IMO appears more consistent with the generation sector, albeit with a higher debt ratio than is experienced in the sector.	<p>The IMO notes Perth Energy's submission. The gearing ratio is stipulated in the Market Procedure.</p> <p>The IMO notes that PwC, in its review for the MRCPWG, recommended that the gearing ratio be reduced from 40 per cent to 35 per cent based on observations from the list of comparator companies in the electricity generation industry. However, the MRCPWG advised that gearing ratios for Market Participants in the SWIS were likely to be higher</p>

²⁷ Statement on Monetary Policy, November 2012

²⁸ Available at <http://www.rba.gov.au/publications/rdp/2012/2012-07.html>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
				than this and that it was appropriate to retain a gearing ratio of 40 per cent for the MRCP.
38	Merredin Energy	Fixed O&M	<p>Merredin Energy has recently entered into an O&M agreement and a separate energy dispatch services agreement. The cost of the energy dispatch services is a fixed annual fee of \$200,000 regardless of the GWs generated.</p> <p>The costs of the energy dispatch services have been completely ignored by SKM. The services are necessary in order to comply with the new balancing market regime including lodging all STEM and balancing bids, commissioning, testing, outage and other notices.</p> <p>We have engaged Perth Energy to provide energy dispatch services and understand it is the only business that provides such services to independent generators. Accordingly, the fixed O&M costs in the MRCP must be increased by \$200,000. If the IMO is minded to continue ignoring those costs, we call on the IMO to make that service available to generators free of charge.</p>	<p>The cost described by Merredin Energy relates to its interaction with the energy market. The IMO considers that such a cost should be compensated through the energy market.</p> <p>Further, the Market Procedure does not make specific allowances for the cost of operational interaction with the Market as it is envisaged that these will be limited for a peaking plant that operates infrequently. Market Participants may submit standing offers into both the STEM and the Balancing Market. The IMO notes that the MRCP is based on a theoretical power station and may not reflect the specific risks and circumstances of individual projects. As the MRCP reflects the marginal cost of entry of new capacity, the IMO considers it inappropriate to include such corporate overhead costs that may be associated with a single-asset company.</p>
39	Merredin Energy	Fixed O&M	<p>We note very little supporting information has been provided by SKM on the O&M components generally. We consider the general O&M costs including the allocations to plant operator labour and corporate overheads to be substantially understated. It might be useful for a further analysis of the O&M costs be undertaken prior to setting the final MRCP. It would also be useful for SKM to consider the costs associated with staying abreast of and complying with changes to the WEM procedures in the O&M costs.</p>	<p>SKM has provided for \$2.2M in annual O&M costs in its report with a high-level breakdown, to which are added insurance and network access charges (a further \$2.8M). The IMO notes that SKM's estimates are based on SKM's expertise from a range of projects with varying characteristics, not from a deterministic calculation.</p> <p>The IMO notes that the MRCP is based on a theoretical power station and may not reflect the specific risks and circumstances of individual projects. As the MRCP reflects the marginal cost of entry of new capacity, the IMO considers it</p>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
				inappropriate to include corporate overhead costs that may be associated with a single-asset company.
40	Merredin Energy	Fixed O&M	<p>SKM estimated the annual costs of EPA charges and emissions tests to total only \$32,000. We would certainly welcome the opportunity for SKM to complete that work for Merredin at a fixed fee of that amount!</p> <p>The cost of burning diesel for compliance tests should be included in the consent costs. Expected STEM revenues earned from the testing regime could be netted off the costs, although those revenues are likely to be negligible (as discussed above in relation to the commissioning costs). The consent cost parameter should also include the costs associated with maintaining and renewing generation licences and compliance with the Clean Energy Act (Cth) which is a recent additional obligation placed on generators.</p>	<p>The IMO considers that a prudent generator will endeavour to schedule any requirement for the testing of a facility to meet Reserve Capacity Test requirements, at the same time as any other regulatory or operational requirements to operate the facility.</p> <p>As the MRCP reflects the marginal cost of entry of new capacity, the IMO considers it inappropriate to include corporate overhead costs.</p>
41	Community Electricity	Fixed O&M – Network Access Charges	We expressly support using the approved Network Access Price List in determining the network access charges, including any adjustments as necessary.	The IMO notes Community Electricity's support.
42	Merredin Energy	Fixed O&M – Insurance Costs	Merredin Energy recently placed asset replacement and business interruption insurance with Chartis. As part of that process, Chartis required that we commission a site survey annually. Chartis quoted \$20,000 cost of the initial survey it was to conduct, with the survey cost charged to Merredin Energy. While that is only a modest cost in the scheme of insurance, we recommend the costs of annual insurance surveys be incorporated in the MRCP.	The IMO has consulted with a well-known insurance broker in relation to site surveys for the placement of insurance. This broker has confirmed to the IMO that it is common practice to for insurers to require that a site survey be completed before offering insurance. The IMO has included an allowance of \$20,000 to meet the cost of performing an annual site survey.
43	Merredin Energy	Fixed O&M – Insurance	The sums insured are not specifically identified but can be inferred. For asset replacement and business interruption	The IMO has consulted with a well-known insurance broker in relation to the insurance of fuel. This broker has confirmed to the IMO that it is

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
		Costs	<p>insurance the sum insured should be increased to include:</p> <ul style="list-style-type: none"> • \$743,800 worth of liquid fuel stored on site. Stored fuel is a valuable commodity and in the event of a total loss, the insurer should be expected to meet the cost of refilling tanks. We remain perplexed as to why any owner of a power station would elect to exclude that from the sum insured. • Following a total loss event and the rebuild of the plant, further commissioning and testing work would need to be undertaken. The costs of burning diesel to complete the commissioning work would ordinarily be borne by the insurer and therefore needs to be included in the sum insured. Based on Merredin Energy's recent commissioning experience (discussed earlier in this submission) we calculate the increase to the sum insured to be \$4.0m for this item. • The costs of debris removal and decontamination expenses should also be included in the sum insured. 	<p>common practice to insure the fuel stock. Consequently, the IMO has increased the assumed limit of liability in its calculation of the asset replacement and business interruption insurance cost to include the full Fixed Fuel Cost.</p> <p>The IMO notes that the assumed limit of liability includes all costs covered by margin M (18.77% of EPC). Margin M includes allowances for commissioning and testing of plant.</p> <p>The IMO considers that some of the costs covered by margin M would not be required to be paid in the event of a total loss event (such as the cost of raising capital and environmental approvals), while some additional site preparation may be required. On balance, the IMO considers that the assumed limit of liability would provide adequate coverage for a total loss event.</p> <p>The IMO also notes that the Margin M also includes a substantial allowance of 5% for Contingencies. In its report, SKM indicates that this allowance may include a range of costs including "removal of debris or contamination".</p>
44	Merredin Energy	Fixed O&M – Insurance Costs	<p>Merredin Energy's business interruption insurance policy has a 30 day deductible period. We would encourage the IMO to consider applying a lower deductible and increase the premium. If the IMO remains minded to maintain a 60 day deductible period (or \$4.3m), we would argue it is duty bound to include an allowance for the costs of forced outage refunds to reflect the cost of this self insurance. We would suggest a forced outage of two months for each 30 years of operations (i.e. an average cost of \$143,000 pa or 0.06% of the business interruption sum insured).</p>	<p>The IMO notes that the estimate of business interruption insurance costs in the 2012 MRCP was based on a 45-day deductible period. However, the in consulting with well-known insurance brokers the IMO received advice that it has become common practice for power station operators to have a 60-day deductible period.</p> <p>As noted in response 34 above, the MRCP is based on a theoretical power station and may not reflect the specific risks and circumstances of individual</p>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
				projects.
45	Merredin Energy	Fixed O&M – Insurance Costs	Any prudent owner of a power station should also maintain minimum workers compensation cover and pollution liability insurance. Pollution liability insurance covers the risks associated with the gradual leakage of diesel from the storage tanks and is essential for a power station owner with 815kL of diesel continually stored on site. These risks can lead to material financial losses and are not covered by standard asset replacement or business interruption insurance. The premia associated with these policies is should be added to the annual insurance costs.	<p>The IMO notes Merredin Energy's comments.</p> <p>In relation to workers compensation insurance, the MRCP reflects the marginal cost of entry of new capacity and hence the IMO considers it inappropriate to include corporate overhead costs.</p> <p>Step 2.5.3(b) of the Market Procedure stipulates that the MRCP is to include estimated insurance costs "<i>in respect of power station asset replacement, business interruption and public and products liability insurance</i>". This precludes the inclusion of an allowance for pollution liability insurance. The IMO will discuss this issue with the MAC in 2013. The IMO suggests that Merredin Energy make a submission to the ERA as part of its upcoming review (as required under MR 2.26.3).</p>
46	Verve Energy	Capacity Refund Allowance	<p>As part of the submissions process on the Five-Yearly Review of the Methodology and Process for Determining the MRCP (PC_2011_06) Verve Energy noted a concern that the non-inclusion of an adjustment for Forced Outage rates in the MRCP formula could have a serious financial impact, even for plants with a relatively low Forced Outage rates. Verve Energy's full submission on this is available on the IMO's website.</p> <p>In response to this concern the IMO noted that:</p> <p>"...an allowance for Forced Outages should be reconsidered in the future, based on analysis of market data following the implementation of any changes to the Reserve Capacity refund regime, which are expected to be significant..."</p>	<p>The IMO notes Verve's comments. The IMO will discuss this issue with the MAC in 2013. The IMO suggests that Verve Energy make a submission to the ERA as part of its upcoming review (as required under MR 2.26.3).</p>

No.	Submitter	Component/ Issue	Comment/Change Requested	IMO's response
			<p>Verve Energy is aware that, as part of the Reserve Capacity Mechanism Working Group's deliberations, there has been an in principle agreement regarding the concept of adopting a dynamic refund mechanism.</p> <p>As such, Verve Energy requests that the IMO add a review of "the potential inclusion of an adjustment for Forced Outages in the MRCP calculation" into its work plan. Verve Energy requests that this review to commence six months after the implementation of a dynamic refund mechanism.</p>	

6. CONCLUSION

The IMO has conducted a review of the main factors used to determine the MRCP, in accordance with the Market Procedure.

For the 2013 Reserve Capacity Cycle, the IMO proposes that the MRCP be set at \$157,000 per MW per year.

The MRCP of \$157,000 per MW per year represents a decrease of 4.2% from the 2012 MRCP. The main drivers of the lower MRCP have been the reduction in WACC as well as a net decrease in capital costs related to the Power Station and Fixed Fuel Costs.

The 2013 MRCP computation has been included in Appendix B and a comparison between the 2012 and 2013 MRCPs can be found in Appendix C.

APPENDIX A: WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The pre-tax real Officer WACC is used for the determination of the Maximum Reserve Capacity Price. The formulae are shown below:

$$WACC_{real} = \left(\frac{(1 + WACC_{nominal})}{(1 + i)} \right) - 1$$

and

$$WACC_{nominal} = \frac{1}{(1 - t(1 - \gamma))} R_e \frac{E}{V} + R_d \frac{D}{V}$$

where the nominal Return on Equity is calculated as:

$$R_e = R_f + \beta_e \times MRP$$

and the nominal Return on Debt is calculated as:

$$R_d = R_f + (DRP + d)$$

Pricewaterhouse Coopers (PwC) calculated the debt risk premium and the IMO reviewed the remaining Annual parameters. A table of the parameters and values are shown in Table A1 below. The volatile Minor parameters, highlighted in yellow, have been recalculated since the publication of the final report so that the most recent numbers are used.

Table A1: WACC parameters for 2012 and 2013

Parameter	Notation	2013 Value	2012 Value
Nominal Risk Free Rate of Return (%)	R_f	3.14	3.92
Expected Inflation (%)	i	2.57	2.55
Real risk free rate of return (%)	R_{fr}	0.55	1.34
Market Risk Premium (%)	MRP	6	6
Asset beta	β_a	0.5	0.5
Equity beta	β_e	0.83	0.83
Debt Margin / Debt Risk Premium (%)	DRP	2.71	4.13
Debt issuance costs (%)	d	0.125	0.125
Corporate tax rate (%)	t	30	30
Franking credit value	γ	0.25	0.5
Debt to total assets ratio (%)	D/V	40	40
Equity to total assets ratio (%)	E/V	60	60

For the purposes of the 2013 MRCP:

WACC = 5.95%

APPENDIX B: CALCULATION OF THE MAXIMUM RESERVE CAPACITY PRICE

The Maximum Reserve Capacity Price is calculated as described by the *Market Procedure: Maximum Reserve Capacity Price*. This is shown below:

$$\text{MRCP} = \text{ANNUALISED_FIXED_O\&M} + (\text{ANNUALISED_CAP_COST} / \text{CC})$$

where:

MRCP is the Maximum Reserve Capacity Price to apply in a Reserve Capacity Auction.

ANNUALISED_FIXED_O&M is the annualised fixed operating and maintenance costs for the power station and any associated electricity transmission facilities, expressed in Australian dollars, per MW per year.

ANNUALISED_CAP_COST is the CAPCOST, expressed in Australian dollars, annualised over a 15 year period using the Weighted Average Cost of Capital (WACC).

CC is the expected Capacity Credit allocation determined in conjunction with the power station capital cost, expressed in MW.

Table B1: 2013 MRCP and associated parameters

Parameter	Value	Unit
2012 MRCP	\$157,000.00	A\$/MW/Year
Where		
ANNUALISED_FIXED_O&M	\$34,238.67	A\$/MW/Year
ANNUALISED_CAPCOST	\$19,599,805.92	A\$/Year
CC	159.6	MW

Table B2: ANNUALISED_CAPCOST and associated parameters

Parameter	Value	Unit
CAPCOST	\$190,938,543.97	A\$
Where		
PC	\$829,446.75	A\$/MW
M	18.87%	%
TC	\$115,124.00	A\$
CC	159.6	MW
FFC	\$7,069,232.08	A\$
LC	\$2,693,872.28	A\$
WACC	5.95%	%
Annualisation		
ANNUALISED_CAPCOST	\$19,599,805.92	A\$/Year
Where		
CAPCOST	\$190,938,543.97	A\$
WACC	5.95%	%
Term of Finance (Years)	15	Years

Parameter	Value	Unit
CAPCOST	\$190,938,543.97	A\$
Where		
PC	\$829,446.75	A\$/MW
M	18.87%	%
TC	\$115,124.00	A\$
CC	159.6	MW
FFC	\$7,069,232.08	A\$
LC	\$2,693,872.28	A\$
WACC	5.95%	%
Annualisation		
ANNUALISED_CAPCOST	\$19,599,805.92	A\$/Year
Where		
CAPCOST	\$190,938,543.97	A\$
WACC	5.95%	%
Term of Finance (Years)	15	Years

APPENDIX C: COMPARISON BETWEEN THE 2012 AND 2013 MAXIMUM RESERVE CAPACITY PRICES

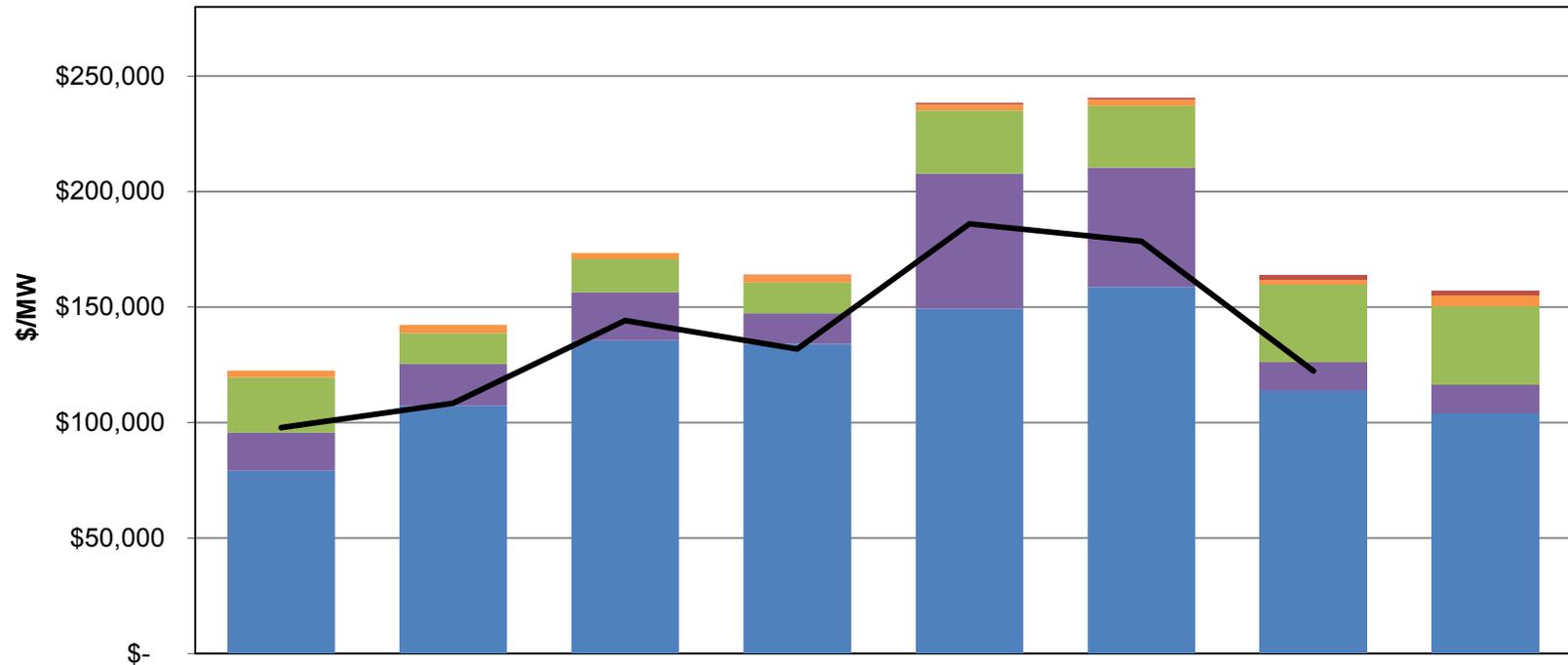
Table C1: Comparison between 2012 and 2013 MRCPs

Parameter	Reserve Capacity Year		Units
	2013	2012	
PC	\$829,446.75	\$858,987.37	A\$/MW
M	18.87%	18.2%	%
TC (\$/MW)	\$115,124.00	\$109,821.00	A\$/MW
FFC	\$7,069,232.08	\$3,183,074.82	A\$
LC	\$2,693,872.28	\$2,804,181.83	A\$
CAPCOST	\$190,938,543.97	\$191,790,889.30	A\$
Term of Finance	15	15	Years
WACC	5.95%	6.83%	%
ANNUALISED_CAPCOST	\$19,599,805.92	\$20,829,728.91	A\$/Year
CC	159.6	159.6	MW
ANNUALISED_CAPCOST	\$19,599,805.92	\$20,829,728.91	A\$/Year
ANNUALISED_FIXED_O&M	\$34,238.67	\$33,391.76	A\$/MW/Year
MRCP	\$157,000.00	\$163,900.00	A\$/MW/Year

Table C2: Impact of year-on-year changes in input parameters

	Impact (\$)	Impact (%)	MRCP (\$)
2014/15 MRCP			163,900
Escalation factors	+ 400	+ 0.2%	164,300
Power Station costs	- 4,300	- 2.6%	160,000
Margin M	+ 600	+ 0.4%	160,600
Fixed Fuel Cost	+ 2,800	+ 1.7%	163,400
Land Cost	- 100	- 0.1%	163,300
Transmission Cost	+ 600	+ 0.4%	163,900
WACC	- 7,700	- 4.7%	156,200
Fixed O&M	+ 800	+ 0.5%	157,000
Combined impact	- 6,900	- 4.2%	157,000

APPENDIX D: VARIATION IN THE MAXIMUM RESERVE CAPACITY PRICE AND CONSTITUENT COSTS



Capacity Year	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Power Station Cost	\$ 79,110	\$ 107,404	\$ 135,701	\$ 134,091	\$ 149,306	\$ 158,710	\$ 113,971	\$ 104,178
Transmission Costs	\$ 16,558	\$ 18,017	\$ 20,672	\$ 13,151	\$ 58,493	\$ 51,621	\$ 12,329	\$ 12,164
Fixed O& M	\$ 23,900	\$ 13,363	\$ 14,392	\$ 13,431	\$ 27,335	\$ 26,649	\$ 33,384	\$ 34,239
Fuel Costs	\$ 2,907	\$ 3,456	\$ 2,631	\$ 3,151	\$ 2,615	\$ 2,825	\$ 2,239	\$ 4,680
Land Costs	\$ -	\$ -	\$ -	\$ 293	\$ 769	\$ 818	\$ 1,973	\$ 1,783
MRCP (nearest \$100)	\$ 122,500	\$ 142,200	\$ 173,400	\$ 164,100	\$ 238,500	\$ 240,600	\$ 163,900	\$ 157,000
Excess Capacity	6.43%	11.44%	2.19%	5.83%	8.99%	14.59%	13.79%	-
Reserve Capacity Price (per yr) —	\$ 97,837	\$ 108,459	\$ 144,235	\$ 131,805	\$ 186,001	\$ 178,477	\$ 122,427	-

APPENDIX E: ABBREVIATIONS

ACT – Australian Competition Tribunal
AER – Australian Energy Regulator
CAPM – Capital Asset Pricing Model
CPI – Consumer Price Index
DRP – Debt Risk Premium
ERA – Economic Regulation Authority
GDP – Gross Domestic Product
GST – Goods and Services Tax
IMO – Independent Market Operator
MRCP – Maximum Reserve Capacity Price
MRCPWG – Maximum Reserve Capacity Price Working Group
MRP – Market Risk Premium
MW – Megawatt
OCGT – Open Cycle Gas Turbine
O&M – Operation and Maintenance
PwC – Pricewaterhouse Coopers
RBA – Reserve Bank of Australia
SKM – Sinclair Knight Merz
SWIS – South West interconnected system
WACC – Weighted Average Cost of Capital
WEM – Wholesale Electricity Market