imo
Independent Market Operator

Independent Market Operator

Draft Report: Maximum Reserve Capacity Price Review for the 2013/14 Reserve Capacity Year

November 2010

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 conduct a review of the Maximum Reserve Capacity Price. This Draft Report details the outcome of the review conducted in 2010 to determine the Maximum Reserve Capacity Price for the 2011 Reserve Capacity Cycle. The value used for the 2011 Reserve Capacity Cycle will be effective from 1 October 2013 through to 1 October 2014.

The 2011 Maximum Reserve Capacity Price proposed by the IMO in its Draft Report is $232,500 per MW per year.

The review process includes a technical costing of the following components:

- Developing and constructing an Open Cycle Gas Turbine (OCGT) power station with a nominal nameplate capacity of 160 MW;
- Land costs associated with developing the OCGT power station;
- Technical connection to the 330 kV transmission system;
- Operations and maintenance costs associated with the OCGT power station and the transmission components;
- Developing and constructing liquid fuel storage facilities; and
- Legal, approval and financing costs.

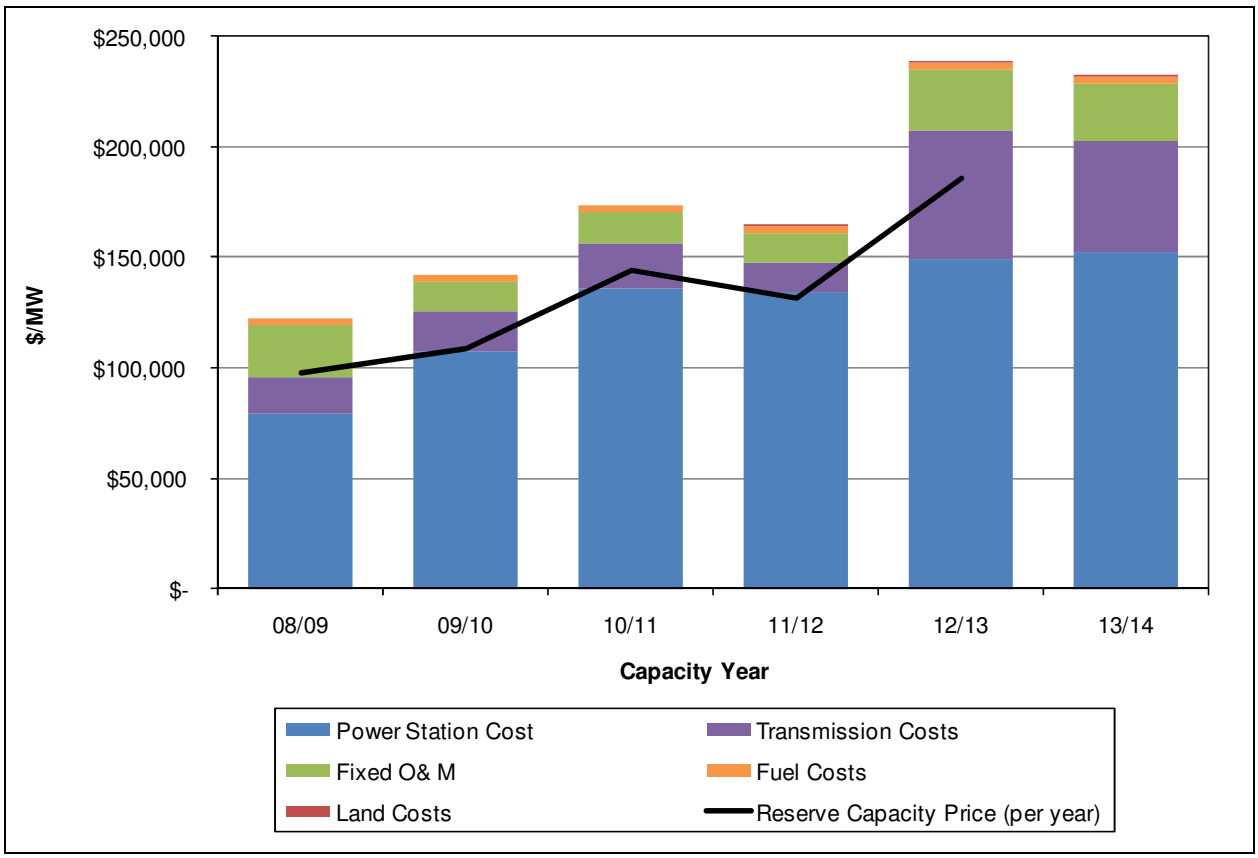
The review process considers a range of locations throughout the South West interconnected system where generation projects are reasonably likely to be connected. The land and transmission connection costs are estimated for each of the nominated locations. The Maximum Reserve Capacity Price is then calculated for each location and the least cost location is chosen. For the 2011 review, Kemerton has been determined to be the location with the least cost.

The Maximum Reserve Capacity Price determined for the 2011 Reserve Capacity Cycle is approximately 2.5% lower than the Maximum Reserve Capacity Price of $238,500 determined for the 2010 Reserve Capacity Cycle. The main changes have resulted from:

- a decrease in the transmission connection cost, resulting from reduced shared connection asset costs and an adjustment to the determination of easement acquisition costs;
- a decrease in the transmission Operation and Maintenance costs, resulting from the exclusion of GST from the Western Power tariff charges; and
- incremental increases in land costs and the costs of constructing the power station and fuel storage and handling facilities.

The magnitude of these changes is detailed within this report.

The IMO notes that the Maximum Reserve Capacity Price has varied considerably since the first determination for the 2008/09 Capacity Year. The graph below (also in Appendix D) provides further information on the variation of the Maximum Reserve Capacity Price and the component costs.



As can be seen in the graph, the main drivers of price growth have been the Power Station Cost and Transmission Costs. Significant increases in commodity prices and labour costs have caused the Power Station Cost to increase by 93% since the 2008/09 Maximum Reserve Capacity Price was determined (in 2005). The Transmission Costs have risen sharply as spare capacity in the transmission network has been utilised, such that the connection of a 160 MW facility now requires significant augmentation to the network.

The IMO seeks submissions on this Draft Report. Information on the public submission process is included within the report and can also be found in the Reserve Capacity section of the IMO website (www.imowa.com.au/mrcp).

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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 conduct a review, in accordance with the Market Procedure for Determination of the Maximum Reserve Capacity Price (Market Procedure), of a number of the components that are used to determine the MRCP. The results of this review, and the proposed revised value for the MRCP, are published in the form of a Draft Report.

This Draft Report presents the updated component costs as determined for the 2011 Reserve Capacity Cycle. The IMO uses publicly available information, together with advice from independent engineering and economics consultants and Western Power, to review the various input parameters that are used in calculating the MRCP.

This Draft Report is published on the IMO website (www.imowa.com.au/mrcp) and a public consultation process will be held so that comments from stakeholders and other interested parties can be taken into consideration prior to publication of the Final Report. The final MRCP is then submitted to the Economic Regulation Authority (ERA) for approval.

This Draft 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 Draft Report has been prepared for the 2011 Reserve Capacity Cycle and the MRCP will be effective from 1 October 2013 through to 1 October 2014.

1.2 General Costing Methodology and Structure of this Draft Report

The yearly review 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 located with 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 and financing costs and contingencies; and
- the Weighted Average Cost of Capital (WACC).

In line with previous years, Sinclair Knight Merz (SKM) have estimated the capital cost for the power station, the margin for indirect costs and contingencies and the O&M costs associated with the OCGT and the transmission connection assets. The same methodology for calculating these costs has been applied for the 2010 MRCP.

The IMO commissioned Landgate to develop cost estimates of land parcels in areas that would be suitable for the development and construction of an OCGT power station. The locations are listed in the Market Procedure and have been selected as regions in which generation projects are reasonably likely to be proposed.

Under the Market Procedure, Western Power is required to provide the connection costs associated with connecting an OCGT power station to the transmission system. For the 2011 MRCP, Western Power has again been requested to provide this information for the same list of locations for which the land costs are developed. This gives a clearer indication of the connection costs faced by project developers at likely sites for power station development.

The land and transmission connection costs are then combined and the least cost location is selected. This cost optimisation ensures that the MRCP is based upon the most economically efficient development outcome.

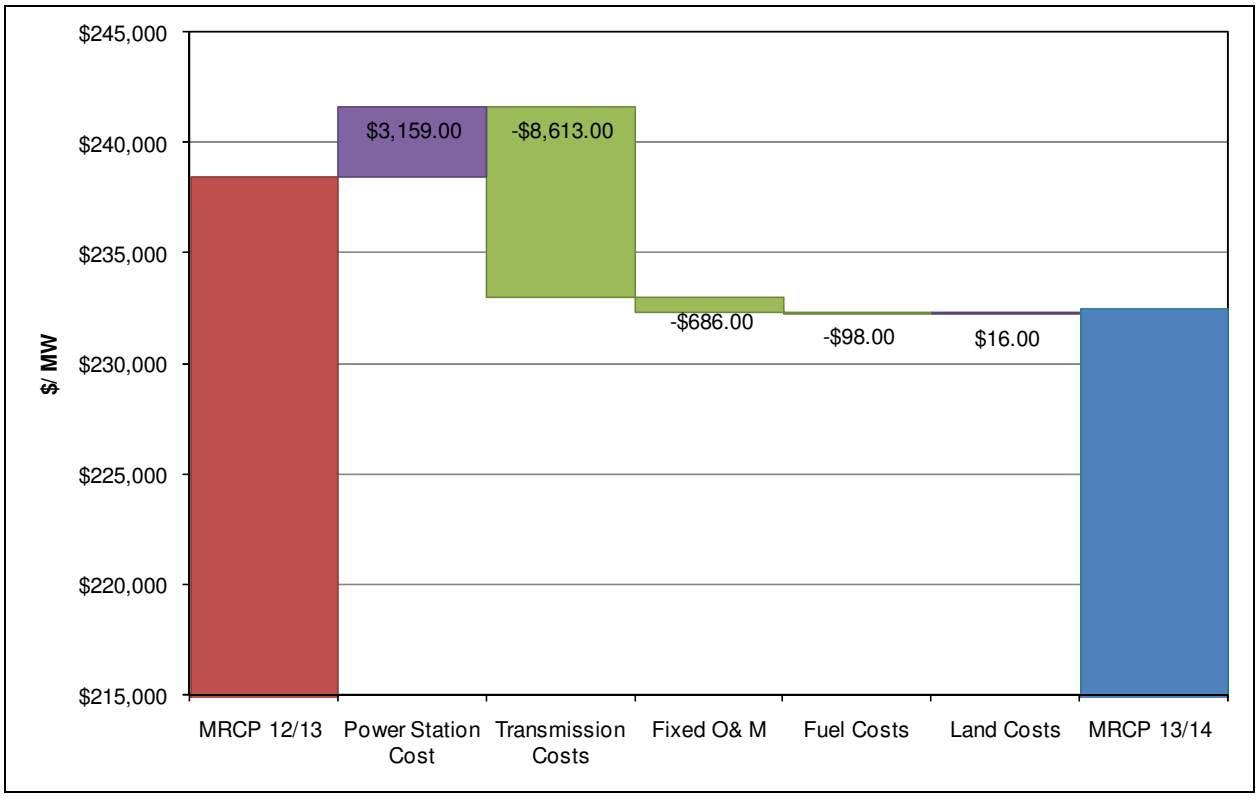
For the 2011 MRCP, the IMO commissioned GHD to update the values determined in their 2010 review of the costs associated with building liquid fuel storage and handling facilities for the power station.

The Weighted Average Cost of Capital has been determined in accordance with the Market Procedure, with the Minor parameters being updated for the IMO by the Allen Consulting Group (ACG). The Major parameter values are as laid out in the Market Procedure.

1.3 MRCP Outcome for the 2011 Reserve Capacity Cycle

Following the review of the MRCP for the 2011 Reserve Capacity Cycle the IMO proposes a value of the MRCP of $232,500 per MW per year.

This is a reduction of 2.5% from the 2010 MRCP of $238,500 per MW per year. The chart below shows the contribution of the various components to the reduction from the 2010 MRCP to the 2011 MRCP.



While many of the MRCP components have exhibited marginal change from last year, the reduction in the MRCP has resulted from reduced shared transmission connection asset costs, an adjustment to the determination of the easement acquisition cost and the exclusion of GST from Western Power tariff charges.

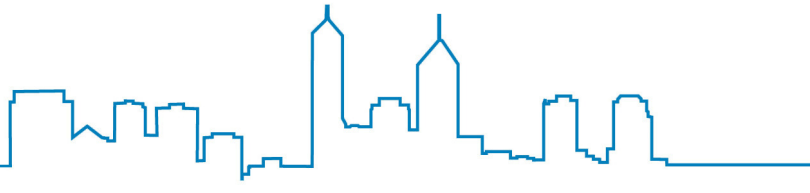
The IMO notes that the Maximum Reserve Capacity Price has varied considerably since the first determination for the 2008/09 Capacity Year. The graph in Appendix D provides further information on the variation of the Maximum Reserve Capacity Price and the variation in the component costs.

The main drivers of price growth have been the Power Station Cost and Transmission Costs. Significant increases in commodity prices and labour costs have caused the Power Station Cost to increase by 93% since the 2008/09 Maximum Reserve Capacity Price was determined (in 2005). The Transmission Costs have risen sharply as spare capacity in the transmission network has been utilised, such that the connection of a 160 MW facility now requires significant augmentation to the network.

1.4 Supporting Documents

The following related documents are available on the IMO website at www.imowa.com.au/mrcp:

- Letter from Landgate, dated 5 October 2010, *Land Values for Reserve Capacity Price*;
- Allen Consulting Group report, dated October 2010, *Update of WACC Minor Parameters for the Purpose of Determining the Maximum Reserve Capacity Price*;
- SKM report, dated 16 November 2010, *Review of the Maximum Reserve Capacity Price – Power Station Elements*;
- SKM report, dated 16 November 2010, *Review of the Maximum Reserve Capacity Price – Non Power Station Elements*;
- GHD report, dated November 2010, *Review of Fixed Fuel Cost for Maximum Reserve Capacity Price in the Wholesale Electricity Market (Diesel Fuel Storage and Handling Facility*; and
- Western Power report, dated 15 November 2010, *Transmission Cost Estimate for the Maximum Reserve Capacity Price for 2013/14*.



2. ESCALATION OF COSTS

2.1 Consumer Price Index (CPI)

The following CPI values are quoted by the Australian Bureau of Statistics (ABS) for the period from June 2009 to June 2010.

CPI June 2009	167.0
CPI June 2010	172.1

The CPI provided by the ABS is the weighted average of eight capital cities within Australia[1]. These values indicate an inflation rate of 3.1% over the period June 2009 to June 2010. The CPI is used to escalate prices that are not determined by SKM as part of the industry escalation of the power station or transmission connection capital costs.

2.2 Industry Escalation

The IMO requested SKM to develop industry escalation figures for the 2011 MRCP. These are used to reflect the changes in costs from the time that price reviews were conducted in 2010 to the time the MRCP for 2011 will come into effect. The approach of calculating escalation figures is continued from previous years. Escalation parameters have been calculated for both the transmission and power station components of the capital costs.

In order to gauge the escalation figures, SKM has investigated a number of publicly available indices and has assessed the impact of these indices on construction and actual component costs. SKM has determined that for the switchyard assets the appropriate escalation factor would be 0.82%. For the transmission line costs, SKM has determined an escalation factor of -2.72%, which has decreased due to the reduction in base metal prices from 2009 to 2010. SKM notes that the major component of the connection assets (switchyard and transmission line) fixed O&M cost is labour cost. Therefore, the composite cost escalation index determined for the fixed O&M costs is equivalent to the Australian electricity-water-gas industry sector labour cost escalation index of 4.4% for the 2009 to 2010 period. SKM has also determined an escalation factor applicable to the power station capital cost of construction in order to adjust 2009 prices relative to 2010. This escalation takes into account decreases in labour rates and lower CPI growth over the year 2009-2010.

The IMO proposes to use cost escalations of 0.82% and -2.72% for the switchyard and transmission materials related components respectively, 4.4% for transmission and switchyard O&M components and 3.86% for generation-related components when translating 2010 costs into to June 2011 costs.

[1] CPI Values and cities available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/6401.0?opendocument#from-banner=LN

3. INPUT PARAMETERS TO THE MAXIMUM RESERVE CAPACITY PRICE CALCULATION

3.1 Power Station Capital Costs (PC[t])

The IMO commissioned SKM to provide generation plant capital costs for a 160 MW OCGT power station located within the SWIS. The process for calculating the power station capital costs is the same as the process applied last year for the 2010 MRCP.

SKM compared the capital costs for a generic 160 MW OCGT power station (including procurement, installation and commissioning) with projects of similar size in order to develop the cost estimate for the parameter PC[t]. The costs for these projects are normalised for plant size, configuration and timing and non-generic costs applicable to specific projects are removed to best approximate the cost of a 160 MW OCGT power station in June 2010 money terms. The final cost estimate is divided by 160 MW and escalated by 3.86% to 2011 prices to obtain the price per megawatt value used in the MRCP calculation.

For the purposes of the 2011 MRCP:

PC[2011] = A $ 790,634.25 per MW

This price represents an increase of 1.5% from the corresponding value for the 2010 MRCP. SKM notes in its report that the gas turbine market in the Middle East, Asia and Australia region appears to be relatively steady. The upward pressure on power station capital costs from higher commodity prices and labour costs have been offset somewhat by the increased strength of the Australian dollar against other currencies.

3.2 Factor for legal, financing, approvals and contingencies (M)

The parameter M is defined as a margin to cover legal, approval, and financing costs and contingencies. SKM was commissioned to provide an estimate of these costs for 2011. This is estimated by normalising the costs associated with recent comparable developments, excluding any abnormal costs that may be particular to individual projects. The margin M is added as a fixed percentage of the capital cost of developing the power station

The value of margin M of 18.6% for the 2011 MRCP is the same as the 2010 value. SKM notes in its report[2] that the Global Financial Crisis has led to a scarcity of comparative projects in the last year. The margin M value is based on SKM's experience and discussions with industry contacts.

The margin M is added as a fixed percentage of the capital cost of developing the power station.

[2] See Section 4 of the SKM report *Review of the Maximum Reserve Capacity Price 2010 – Power Station Elements*.

For the purposes of the 2011 MRCP:

M = 18.6%

3.3 Transmission Connection Costs (TC[t])

For the 2011 MRCP, Western Power determined the transmission connection costs as part of its obligations under the Market Procedure. These included the direct connection costs to the transmission system and deep connection costs used to reinforce the network under certain circumstances.

Western Power has provided estimates of the cost of connecting the 160 MW OCGT at each of the locations for which land prices are determined. The estimates presented below are based on the optimal (least cost) location, taking varying land prices and varying connection costs into account. For the 2011 MRCP, the optimal location is Kemerton.

For further information regarding the costing provided by Western Power please refer to the Western Power report[3] published on the IMO website (http://www.imowa.com.au/mrcp).

3.3.1 Dedicated Connection Asset Costs

Dedicated connection asset costs relate to the assets that are dedicated to connecting the power station directly to the physical network. For the purposes of the 2011 review, these costs include the transmission line assets connecting the power station to the wider network and the dedicated switchyard assets that facilitate the connection between the power station and the transmission system. These estimates are then adjusted in line with SKM's determination of the transmission assets escalation.

Total Dedicated Connection Asset Costs = A$9.182 M

This represents an increase of 103% when compared with the corresponding cost from last year's MRCP, resulting from a change in the method employed by Western Power in determining the cost of the transmission line assets. Whereas the previous estimates were based on simple unit costs of transmission line construction, Western Power have this year accounted for the fixed costs associated with constructing a short line length.

3.3.2 Shared Connection Asset Costs

Western Power has also developed estimates of the shared connection assets as part of the transmission connection capital costs. These include an estimate of deep network augmentation costs or network reinforcement costs, which are required under certain circumstances in order

[3] See Western Power report *Transmission Cost Estimate for the Maximum Reserve Capacity Price for 2013/14*.

to maintain Power System Security and Power System Reliability. These costs can vary greatly depending on the nature of the generation being developed, and the peculiarities of the local transmission system to which the power station will be connected. A shared component of the substation costs is also included.

Total Shared Connection Asset Costs = A$36.295 M

This represents a decrease of 22% from the corresponding cost from last year's MRCP, which was also based on Kemerton representing the least cost location, While only 330kV augmentation was considered last year, Western Power have this year considered augmentation to both the 330kV and 132kV networks to allow connection of the power station to the transmission network.

3.3.3 Easement Costs

The costs for the transmission line easement acquisition, estimated by SKM[4], are escalated by CPI and added to the total transmission costs.

This is the second year that these costs have been used in the calculation of the MRCP. For the 2010 MRCP, SKM estimated the cost of buying the land along the 2km long transmission line. In this year's report, SKM have acknowledged that a project developer may not be required to purchase the full portion of land and could instead secure easement rights for some of the all of the easement. In adopting this philosophy, SKM have estimated that easement costs would be approximately 50% of the purchase value of the land. The resulting estimate of A$3.607M is 46% lower than the easement cost used in the 2010 MRCP.

For the purposes of the 2011 MRCP:

Total Easement Costs = A$3.607 M

3.3.4 Total Transmission Connection Costs

Total Transmission costs have been calculated by summing the costs determined for dedicated connection assets, shared connection assets and easement acquisition.

For the purposes of the 2011 MRCP:

TC[2011] = A$49.083 M

[4] See Section 3.3 of the SKM report *Review of the Maximum Reserve Capacity Price 2010 – Non Power Station Elements*

3.4 Fixed Fuel Costs (FFC[t])

Fixed fuel costs for the determination of the 2011 MRCP were calculated by GHD. The IMO commissioned GHD to update the costing provided in their October 2009 report ("Review of Fixed Fuel Cost for Maximum Reserve Capacity Price in the Wholesale Electricity Market") with prices that reflect those in 2010.

Fixed fuel costs as determined by GHD were A$2.670 M when adjusted to 2011 prices by CPI. This represents a 3.1% increase (A$80,000) from the fixed fuel cost determined for the 2010 MRCP. This rise is reflective of marginal cost increases for several of the fuel storage and handling components and the cost of diesel fuel.

For the purposes of the 2011 MRCP:

FFC[2011] = A$2.670 M

3.5 Land Costs (LC[t])

The IMO commissioned Landgate to update the land cost estimates to be used in the MRCP determination. These estimated land valuations are based on guidelines outlined in the Market Procedure. Valuations were conducted in those areas 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. Areas that did not require a substantive buffer zone had costs determined based on a 3 ha site. Areas where a substantive buffer zone is required had costs determined based on a 30 ha site.

Land valuations were conducted under the provisions stated in the Market Procedure and assumptions and pricing of the individual parcels of land can be found on the IMO website (http://www.imowa.com.au/mrcp). For the purposes of the MRCP, the lowest cost location is selected for the development of the 160 MW OCGT power station, as outlined in section 3.3.4 of this report. As indicated above, the lowest cost location for the 2011 MRCP is Kemerton.

For the purposes of the 2011 MRCP:

LC[2011] = A$ 772,904

3.6 Weighted Average Cost of Capital (WACC)

The methodology used by the IMO for calculating the WACC was reviewed by the Allen Consulting Group (ACG) in 2007. The IMO has subsequently commissioned the ACG to update the Minor WACC parameters in line with 2010 prices for the 2011 MRCP.

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

For the purposes of the 2011 MRCP:

WACC = 8.14%

The parameters used to determine the WACC were calculated at 29 October 2010. The volatile Minor parameters will be recalculated prior to the publication of the final report so that the most recent numbers are used.

3.7 Capital Costs (CAPCOST[t])

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

$$CAPCOST[t] = (PC[t] \times (1+M) \times CAP + TC[t] + FFC[t] + LC[t]) \times (1+WACC)^{2}$$

For the purposes of the 2011 MRCP:

CAPCOST[2011] = A$ 236.876 M

3.8 Fixed Operation & Maintenance Costs (ANNUALISED_FIXED_O&M[t])

3.8.1 Generation

For the 2011 review, SKM have determined the fixed O&M costs for the generator assets.

An annuity is calculated taking the first 15 years of O&M provided by SKM. The SKM report[5] details the total fixed O&M costs of the OCGT to year 15 as A$ 29.340 M in 2010 terms. This cost is annualised and then escalated at 3.86% to a 2011 value that equates to A$ 12,696.89 per MW per year.

Generation Fixed O&M Costs = A$ 12,696.89 per MW per year

[5] See Table 3-2 of the SKM report *Review of the Maximum Reserve Capacity Price 2010 – Power Station Elements.*

3.8.2 Transmission

SKM provided the fixed O&M costs of the switchyard and transmission line assets. The methodology being used to estimate these costs is contained in SKM's report which is available on the IMO website (www.imowa.com.au/mrcp). These costs form part of the term ANNUALISED_FIXED_O&M[t] in the MRCP calculation.

The direct O&M costs are determined by taking the average of the five-year cumulative transmission costs in SKM's report[6] over the first 15 years and creating an annuity discounted at the real WACC (see Appendix A). The 2010 costs provided in the SKM report have been escalated to 2011 figures using an escalation of 4.4% for both the switchyard and transmission line assets. This results in a cost of A$365.73 per MW per year.

Western Power tariff charges, provided in the Western Power report[7], are added to this and then escalated to 2011 prices through CPI. This results in a combined transmission O&M cost as shown below.

Transmission Fixed O&M Costs = A$ 13,951.76 per MW per year

This value is 7.1% lower than the corresponding value last year. While the Western Power tariff rates have increased by 1% from those used last year, the reduction is due to the exclusion of GST from the Western Power tariff charges.

3.8.3 Total Fixed Operation & Maintenance Costs

For the purposes of the 2011 MRCP:

ANNUALISED_FIXED_O&M[2011] = A$ 26,649 per MW per year

Total fixed operation and maintenance costs have reduced by 2.5% compared to last year, predominantly due to the exclusion of GST from the Western Power tariff charges.

[6] See Table 4-1 and Table 4-2 of the SKM report *Review of the Maximum Reserve Capacity Price 2010 – Non Power Station Elements*.
[7] See Western Power report *Transmission Cost Estimate for the Maximum Reserve Capacity Price for 2013/14*.

4. MAXIMUM RESERVE CAPACITY PRICE CALCULATION

4.1 Annualised Capital Costs (ANNUALISED_CAPCOST[t])

The annualised capital cost is determined using:

- the capital cost of A$ 236.876 M, as determined in Section 3.7;
- the WACC of 8.14%, as determined in Section 3.6; and
- a term of 15 years, as required by the Market Procedure.

For the purposes of the 2011 MRCP:

ANNUALISED_CAPCOST[2011] = A$ 27.911 M per year

This represents a decrease of 2.5% compared to the value from the 2010 MRCP. The main driver of this decrease has been the reduction of the shared transmission connection cost for the power station.

4.2 Annualised Fixed Operation & Maintenance Costs (ANNUALISED_FIXED_O&M[t])

The total annualised fixed O&M costs are outlined in Section 3.8.3. These are calculated by summing the fixed O&M costs of the power station assets, transmission line assets and the switchyard assets. All the values that form part of the parameter ANNUALISED_FIXED_O&M[t] are adjusted to 2011 prices by their respective escalation factors.

For the purposes of the 2011 MRCP:

ANNUALISED_FIXED_O&M[2011] = A$ 26,649 per MW per year

4.3 Capacity Parameter (CAP)

For the 2011 MRCP calculation the capacity parameter CAP is set at 160 MW as required in the Market Procedure.

For the purposes of the 2011 MRCP:

CAP = 160 MW

4.4 Summer De-rating Factor (SDF)

The summer de-rating factor is outlined in the Market Procedure.

For the purposes of the 2011 MRCP:

SDF = 1.18

4.5 Calculation

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

PRICECAP[t] = (ANNUALISED_FIXED_O&M[t] + ANNUALISED_CAP_COST[t]) / (CAP/SDF))

Using the values determined by the IMO and presented in previous sections, PRICECAP[2011] for the 2011 Reserve Capacity Cycle is determined to be A$ 232.493.02 which is rounded to:

PRICECAP[2011] = A$232,500 per MW per year

A MRCP of A$232,500 per MW per year is proposed by the IMO. This represents a 2.5% decrease from the 2010 MRCP of $238,500. The main drivers of the lower MRCP have been the reduction in the shared transmission connection asset costs, the adjustment to the determination of the easement acquisition cost and the exclusion of GST in the Western Power tariff charges. The remaining components of the MRCP, specifically the Power Station Capital Cost, Fixed Fuel Cost and Land Cost, have exhibited only marginal changes from last year. Appendix B provides a detailed breakdown of the calculation and Appendix C provides a detailed comparison of the 2011 MRCP parameters and the 2010 MRCP parameters.

5. STAKEHOLDER INPUT

The IMO invites submissions from all sectors of the Western Australian energy industry, including end users, on the proposed new MRCP to apply for the 2013/14 Capacity Year. Following receipt of public submissions, the IMO will propose a final revised value of the Maximum Reserve Capacity Price to the ERA for approval.

5.1 Submission Guidelines

Submissions must be made in writing and be no longer than five pages in length (12 point font). Claims regarding the appropriateness of the values used by the IMO to determine the MRCP for the 2011 Reserve Capacity Cycle must be accompanied by supporting evidence.

In keeping with the principle of open and transparent processes, all submissions will be published on the IMO website.

5.2 Maximum Reserve Capacity Price Consultation Workshop

Following the close of submissions, the IMO may hold a workshop on the proposed new MRCP to apply for the 2013/14 Capacity Year. Attendance at the workshop may be offered to those who have made a submission. The IMO would then discuss any issues that have arisen and will take into consideration the submissions and the outcome of the workshop when producing the Final Report to be submitted to the ERA.

The IMO will directly contact parties who make a submission with details of the workshop. When making a submission, please include details of one contact that will be nominated to attend the workshop.

5.3 Details for Making a Submission

Submissions should be addressed to:

Troy Forward
General Manager, Development
Independent Market Operator

By post:
PO Box 7096, Cloisters Square
Perth, WA, 6850

By email:
imo@imowa.com.au

By facsimile:
+61 8 9254 4399

The deadline for submissions is:

4.00PM Western Standard Time on Wednesday, 15 December 2010.

General enquiries may be directed to Ben Williams on (08) 9254 4305 or Greg Ruthven on (08) 9254 4301.

6. CONCLUSION

The IMO has conducted a review of the main factors used to determine the MRCP. For the 2011 Reserve Capacity Cycle, the IMO proposes that the MRCP be set at $ 232,500 per MW per year.

The MRCP of $232,500 per MW per year represents a decrease of 2.5% from the 2010 price. The main drivers of the lower MRCP have been the reduction in the shared transmission connection asset costs, the adjustment to the determination of the easement acquisition cost and the exclusion of GST in the Western Power tariff charges.

The 2010 MRCP computation has been included in Appendix B and a comparison between the 2010 and 2011 MRCP's can be found in Appendix C.

As part of the review, the IMO calls for submissions from the Western Australian energy industry, including end users, on the proposed MRCP for the 2011 Reserve Capacity Cycle. The closing date for submissions is Wednesday, 15 December 2010.

The Maximum Reserve Capacity Price has been set four times using the current methodology. Clause 4.16.9 of the Market Rules requires the IMO to conduct a review of the methodology and process for determining the MRCP at least once in every five year period. The Market Advisory Committee (MAC) constituted the Maximum Reserve Capacity Price Working Group (MRCPWG) to undertake this review, which is scheduled to be completed in early 2011. The review will lead to a Procedure Change Proposal for the Market Procedure, with the revised Market Procedure to take effect before the publication of the 2012 Maximum Reserve Capacity Price.

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:

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

and

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

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:

$$R_d = R_f + DRP$$

The Allen Consulting Group reviewed the minor parameters and updated the relevant parameters in line with current prices and values. A table of the parameters and values are shown in Table A1 below. The volatile Minor parameters, highlighted in yellow, will be recalculated prior to the publication of the final report so that the most recent numbers are used.

Table A1: PRICECAP[2011] and associated parameters

Parameter	Notation	2011 Value	2010 Value
Nominal Risk Free Rate of Return (%)	R_f	5.14	5.49
Expected Inflation (%)	i	2.9	3
Real risk free rate of return (%)	R_{fr}	2.37	2.8
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*	5.19	4.3
Corporate tax rate (%)	t	30	30
Franking credit value	γ	0.5	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 2011 MRCP:

WACC = 8.14%

APPENDIX B: CALCULATION OF THE MAXIMUM RESERVE CAPACITY PRICE

The Maximum Reserve Capacity Price is calculated as described by the latest version of the Market Procedure for Determination of the Maximum Reserve Capacity Price. This is shown below:

PRICECAP[t] = ANNUALISED_FIXED_O&M[t] + (ANNUALISED_CAP_COST[t]) / (CAP/SDF))

where:

PRICECAP[t] is the Maximum Reserve Capacity Price to apply in a Reserve Capacity Auction held in a calendar year t.

ANNUALISED_FIXED_O&M[t] is the annualised fixed operating and maintenance costs for a typical open cycle gas turbine power station and any associated electricity transmission facilities, expressed in Australian dollars in year, per MW per year.

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

CAP is the Capacity of an open cycle gas turbine, expressed in MW and Equals 160 MW.

SDF is the summer de-rating factor of a new open cycle gas turbine, and equals 1.18.

Table B1: PRICECAP[2011] and associated parameters

Parameter	Value	Unit
PRICECAP[2011]	**$232,500.00**	**A$/MW/Year**
Where		
ANNUALISED_FIXED_O&M[2011]	$26,648.64	A$/MW/Year
ANNUALISED_CAP_COST[2011]	$27,911,102.56	A$/Year
CAP	160	MW
SDF	1.18	N/A

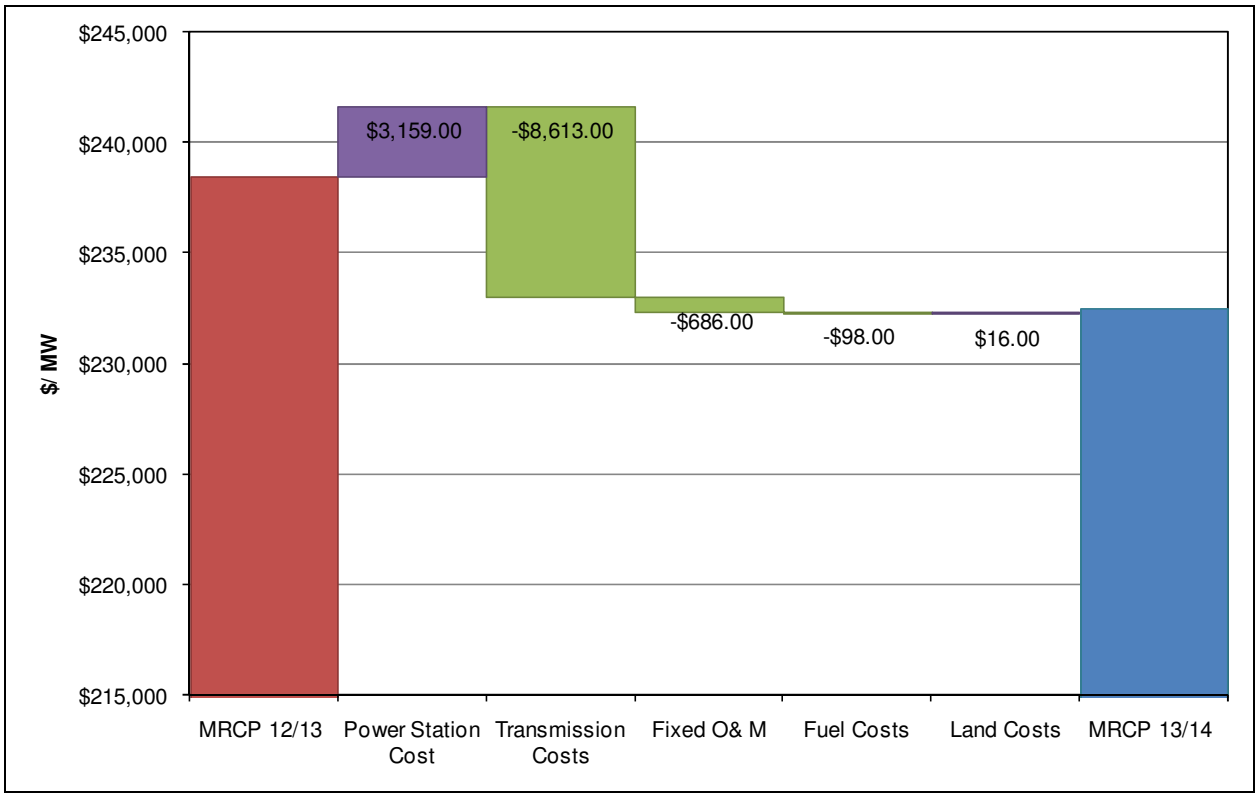
Table B2: ANNUALISED_CAP_COST[2011] and associated parameters

Parameter	Value	Unit
CAP_COST[2011]	**$236,875,729.81**	**A$**
Where		
PC[2011]	$790,634.25	A$/MW
M	18.60%	%
CAP	160	MW
TC[2011]	$49,083,484.08	A$
FFC[2011]	$2,670,126.35	A$
LC[2011]	$772,904.19	A$
WACC	8.14%	%
Annualisation		
ANNUALISED_CAP_COST[t]	**$27,911,102.56**	**A$/Year**
Where		
CAP_COST[2011]	$236,875,729.81	A$
WACC	8.14%	%
Term of Finance (Years)	15	Years

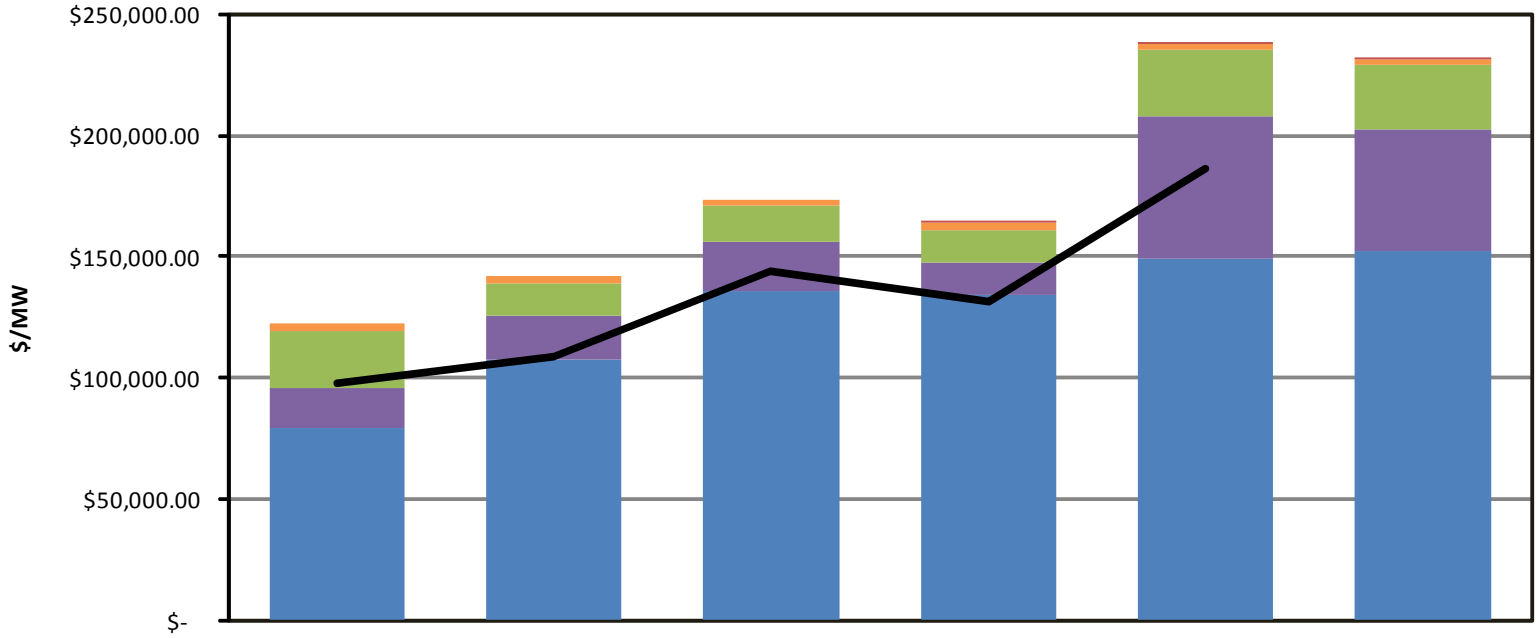
APPENDIX C: COMPARISON BETWEEN THE 2010 AND 2011 MAXIMUM RESERVE CAPACITY PRICES

Table C1: PRICECAP[2011] and associated parameters

Parameter	Reserve Capacity Year 2010	2011	Units
FFC[t]	$2,590,280.00	$2,670,126.35	A$
LC[t]	$761,250.00	$772,904.19	A$
TC[t]	$57,926,935.90	$49,083,484.08	A$
M	18.6%	18.6%	%
PC[t]	$779,195.50	$790,634.25	A$/MW
CAPCOST[t]	$244,210,386.60	$236,875,729.81	A$
Term of Finance	15	15	Years
WACC	8.06%	8.14%	%
ANNUALISED_CAP_COST[t]	**$28,635,599.54**	**$27,911,102.56**	**A$/Year**
CAP	160.00	160.00	MW
SDF	1.18	1.18	N/A
ANNUALISED_CAP_COST[t]	$28,635,599.54	$27,911,102.56	A$/Year
ANNUALISED_FIXED_O&M[t]	$27,334.90	$26,648.64	A$/MW/Year
PRICECAP[t]	**$238,500.00**	**$232,500.00**	**A$/MW/Year**


$245,000
$240,000
$235,000
$230,000
$225,000
$220,000
$215,000
$/ MW
$3,159.00
-$8,613.00
-$686.00
-$98.00
$16.00
MRCP 12/13
Power Station Cost
Transmission Costs
Fixed O& M
Fuel Costs
Land Costs
MRCP 13/14

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
Power Station Cost	$ 79,110.00	$ 107,404.00	$ 135,701.00	$ 134,091.00	$ 149,306.00	$ 152,465.00
Transmission Costs	$ 16,558.00	$ 18,017.00	$ 20,672.00	$ 13,151.00	$ 58,493.00	$ 49,880.00
Fixed O& M	$ 23,900.00	$ 13,363.36	$ 14,392.09	$ 13,431.00	$ 27,335.00	$ 26,649.00
Fuel Costs	$ 2,907.00	$ 3,456.00	$ 2,631.00	$ 3,151.00	$ 2,615.00	$ 2,713.00
Land Costs	$ -	$ -	$ -	$ 293.00	$ 769.00	$ 785.00
MRCP (nearest $100)	$ 122,500.00	$ 142,200.00	$ 173,400.00	$ 164,100.00	$ 238,500.00	$ 232,500.00
Excess Capacity	6.43%	11.44%	2.19%	5.83%	8.99%	NA
Reserve Capacity Price (per year)	$ 97,836.80	$ 108,458.57	$ 144,235.38	$ 131,804.58	$ 186,001.04	NA

APPENDIX E: ABBREVIATIONS

ABS – Australian Bureau of Statistics

ACG – Allen Consulting Group

CPI – Consumer Price Index

ERA – Economic Regulation Authority

GST – Goods and Services Tax

IMO – Independent Market Operator

MAC – Market Advisory Committee

MRCP – Maximum Reserve Capacity Price

MRCPWG – Maximum Reserve Capacity Price Working Group

MW – Megawatt

OCGT – Open Cycle Gas Turbine

O&M – Operation and Maintenance

SKM – Sinclair Knight Merz

SWIS – South West interconnected system

WACC – Weighted Average Cost of Capital

WEM – Wholesale Electricity Market