

Review of methodology for setting the Maximum Reserve Capacity Price and the Energy Price Limits in the Wholesale Electricity Market

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Economic Regulation Authority

WESTERN AUSTRALIA

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Executive Summary

The *Wholesale Electricity Market Rules* (**Market Rules**) require that the Economic Regulation Authority (**Authority**) review the methodology for setting the Maximum Reserve Capacity Price (**MRCP**) and the Energy Price Limits (**EPLs**) under clause 2.26.3 of the Market Rules by no later than 1 October 2013.¹

This is the first time such a review has been undertaken by the Authority since the Wholesale Electricity Market (**WEM**) became fully operational in September 2006.

The WEM comprises separate energy and capacity markets. The imposition of price caps to both the capacity and energy markets were, in large part, a market power mitigation measure. At the commencement of the WEM, the level of competition in the market was limited. Although it was expected that competition would evolve over time, in the interim the issue of market power was a concern due to the dominance of Verve Energy and Synergy and the absence of full retail contestability.

If competition is not effective, market power can be exerted through actions that influence prices. For example, market participants with market power could withhold generation to create conditions of shortage thereby artificially raising clearing prices, or they could submit offers at excessive prices knowing there is no alternative for customers.

Sustained market power is not desirable because it leads to an inefficient level of electricity being produced, and prices that are higher than the efficient level, to the detriment of consumers. In the long term, the best strategy to deal with market power is to facilitate competition to ensure that competitive pressure discourages abnormally high returns. However, in the short term, pending the development of robust competition, measures may be required to protect against market power. Such measures should seek to replicate outcomes that would be observed in a workably competitive market.

Price caps can limit the impact that any misuse of market power can have on prices. Price caps can be set at lower levels in markets such as the WEM, where a capacity mechanism exists which provides payments for the recovery of the capital costs of generators, to some extent.

In a workably competitive electricity market, prices would generally approach the marginal generator's short run marginal cost (**SRMC**). Hence, another form of market power mitigation is to require generators to offer their generation at SRMC.

In response to the concerns regarding lack of competition, the State Government implemented measures to curb market power in the initial WEM design. In the case of the energy market, these measures consisted of the EPLs and a prohibition on market participants pricing offers above SRMC when such behaviour relates to market power. In the case of the capacity market, a price cap, i.e. the MRCP, was set for capacity offers to the Reserve Capacity Auction.

At the commencement of the market, Verve Energy was the sole provider of balancing services and most ancillary services. Reflecting this, all of Verve Energy's generating

¹ Clause 2.26.3 of the Market Rules requires that this review is undertaken not later than the fifth anniversary of the first Reserve Capacity Cycle and, subsequently, not later than the fifth anniversary of the completion of the preceding review. This anniversary date falls on 1 October 2013 based on the interpretation of the reference to the fifth anniversary of the first Reserve Capacity Cycle as a reference to the fifth anniversary of the completion of the first Reserve Capacity Cycle and the final year of the first Reserve Capacity Cycle was 2008.

plant was treated as a single portfolio and dispatched by System Management as required to meet balancing and ancillary services requirements in support of the power system.

Since the commencement of the WEM, there has been a noticeable increase in the number of participants registered with the Independent Market Operator (**IMO**) for the purpose of participating in the WEM. The number of generators has increased from nine at inception to 34 currently. As a result, the spread of capacity across generators has increased. Verve Energy's relative share in terms of allocated Capacity Credits will be reduced to around 50 per cent in 2014 compared to 90 per cent at the start of the market in 2006.

On the demand side, Synergy continues to be the dominant retailer. In addition to contractual arrangements with Verve Energy, Synergy also has large contracts for electricity supply from Griffin Power (Bluewaters) and NewGen. As at 30 June 2012, Synergy reported that it retained approximately 65 per cent of market share in the retail market.²

A new competitive Balancing market was introduced on 1 July 2012 which enabled all generators, instead of just Verve Energy, to compete for the supply of balancing services. A competitive Load Following Ancillary Services (**LFAS**) market was introduced at the same time.

The Authority notes that the level of competition has increased in the WEM, particularly with the entry of new generators and the introduction of competitive markets for balancing and LFAS. However, the Authority considers that, at present, the extent of market concentration in the WEM is still high. Currently, Verve Energy and Synergy control the largest share of the market for both generation and retailing. A possible outcome of merging these entities is that it will further increase the level of concentration in the market. The Authority considers that regulatory intervention will continue to be necessary until the current structural issues are fully resolved and competition in the WEM becomes fully effective.

Taking account of the current level of competition, the Authority considers both the Maximum STEM Price and the Alternative Maximum STEM Price should be retained until competition is sufficiently advanced that there is sufficient incentive for generators to offer energy at SRMC in the absence of the current Market Rule requirement. Once this occurs, it may be sufficient to only retain the Alternative Maximum STEM Price.

Since commencement of the WEM, the IMO has consistently determined that a Reserve Capacity Auction has been unnecessary as there has always been sufficient capacity to meet requirements and it is unlikely an auction will be held in the near future. However, the potential for the exercise of market power in a capacity auction still exists in light of the significant structural issues in the WEM. Consequently, given the persistence of limited competition in the market, the Authority considers it is necessary to retain the price cap, i.e. the MRCP, for capacity offers into the Reserve Capacity Auction.

The Authority's findings and recommendations are summarised below.

² See Synergy, *Annual Report 2011/12*, p.2, http://www.synergy.net.au/about_us/annual_report.xhtml

Summary of findings and recommendations

Finding 1

Section 2.1

The level of market concentration in the WEM remains relatively high, exposing the WEM to the potential misuse of market power, with consequential inefficient market outcomes and detrimental effects to consumers.

Recommendation 1

Section 2.2

Consideration should be given to require Verve Energy to price its offers on an individual facility basis: to the STEM and the Balancing Market, consistent with that facility's SRMC; and to the LFAS market, to reflect the incremental change in the SRMC of the facility providing LFAS, rather than on a portfolio basis as provided by the existing Market Rules.

Recommendation 2

Section 3.1

Consideration should be given to explore the costs and benefits of removing the Minimum STEM Price in the WEM.

Recommendation 3

Section 3.6

The Market Rules should be amended to reflect the principle that the determination of the EPLs and the relevant input components making up the EPLs be based on the highest cost generation plant that exists in the SWIS, without restricting this to a 40 MW OCGT generating plant.

Recommendation 4

Section 3.7

The Market Rules should be amended to require the IMO to develop a Market Procedure that transparently describes the methodology to be used and the process to be followed for the EPLs review.

As part of this Market Procedure development, consideration should be given to: whether a thorough EPLs review should be conducted every three years, with appropriate escalators being applied to the components making up the EPLs between reviews; and the ability for the IMO to conduct a thorough review, at any time, should there be any significant changes in the market.

Recommendation 5

Section 4.2

The linkage between the MRCP and the RCP, as it currently stands, should be broken. An alternative method for setting the RCP when no market price for capacity is available due to a capacity auction not being held, should be explored by the IMO.

Recommendation 6

Section 4.5

The principles for setting the MRCP as a price cap for the purpose of market power mitigation should be clearly stated in the Market Rules. As a principle, the MRCP should be set based on the reasonably expected cost pertaining to the most expensive form of new peaking capacity, located in the SWIS.

The IMO should review the appropriateness of the methodology and estimating methods regarding the input parameters in the MRCP Market Procedure in accordance with the principles for setting the MRCP and make amendments as required.

This review should be undertaken as part of the IMO's next five-yearly review of the MRCP Market Procedure, due in 2015.

Recommendation 7

Section 4.6.1

As part of the IMO's next five-yearly review of the MRCP Market Procedure, the IMO should consider undertaking a thorough MRCP review every three years, with an appropriate escalator being applied to the MRCP between reviews. This should include provision for the IMO to conduct a thorough review, at any time, should there be any significant changes in the market.

Recommendation 8

Section 4.6.2

The relevant clauses in the Market Rules should be reviewed and modified to clearly identify and delineate the nature and scope of the reviews that are required of the Authority and the IMO.

1 Introduction

1. The Market Rules require that the Authority review the methodology for setting the MRCP and the EPLs under clause 2.26.3 of the Market Rules by no later than 1 October 2013.³
2. This is the first time such a review has been undertaken by the Authority since the WEM became fully operational in September 2006.

1.1 The requirement

3. The Market Rules require that the Authority's review of the methodology for setting the MRCP and the EPLs must examine:
 - the level of competition in the market;
 - the level of market power being exercised and the potential for the exercise of market power;
 - the effectiveness of the methodology in curbing the use of market power;
 - historical Reserve Capacity Offers and the proportion of Reserve Capacity Offers with prices equal to the MRCP;
 - historical Short Term Energy Market (**STEM**) Bids and STEM Offers and the proportion of STEM Bids and Offers with prices equal to the EPLs;
 - the appropriateness of the parameters and methodology in clauses 4.16 and the Market Procedure referred to in clause 4.16.3 for recalculating the MRCP;
 - the appropriateness of the parameters and methodology in clause 6.20 for recalculating the EPLs;
 - the performance of Reserve Capacity Auctions, STEM Auctions and Balancing in meeting the Wholesale Market Objectives; and
 - other matters which the Authority considers relevant.
4. The Authority must provide a report to the Western Australian Minister for Energy (**Minister**) on this review.

1.2 The review process

5. The Authority considers the inclusion of the MRCP and the EPLs in the WEM design is a reflection of concerns about the inherited industry structure, particularly the dominance of Verve Energy in generation and Synergy in retail, at the commencement of the market. Although it was anticipated that competition would increase over time, in the interim, regulatory intervention was considered necessary to mitigate the potential exercise of market power to ensure the market could

³ Clause 2.26.3 of the Market Rules requires that this review is undertaken not later than the fifth anniversary of the first Reserve Capacity Cycle and, subsequently, not later than the fifth anniversary of the completion of the preceding review. This anniversary date falls on 1 October 2013 based on the interpretation of the reference to the fifth anniversary of the first Reserve Capacity Cycle as a reference to the fifth anniversary of the completion of the first Reserve Capacity Cycle and the final year of the first Reserve Capacity Cycle was 2008.

function effectively for the protection of consumers. Hence, the Authority's review of the methodology for setting the MRCP and the EPLs has focused on these price limits as market power mitigation measures.

6. In undertaking this review, the Authority has consulted with the electricity industry and the broader community. On 24 June 2013, the Authority published a notice inviting public submissions and a Consultation Paper to assist interested parties in making submissions to the Authority's review. The consultation period closed on 22 July 2013. The Authority received four submissions.⁴
7. In preparing this report, the Authority has taken into account the views expressed by stakeholders.
8. The Authority notes the recent decision by the State Government to merge the two State-owned utilities, Verve Energy and Synergy, which is to take effect from 1 January 2014.⁵ The Authority is also aware that there is a review of the Market Rules, functioning and design of the WEM initiated by the State Government which is currently being progressed by the Public Utilities Office (**PUO**). Outcomes from the PUO's market review and the implementation of the merger of Verve Energy and Synergy by the State Government are likely to have material implications on the future development of the WEM.
9. The Authority has based its review on the current arrangements in the WEM. A further review may be required if the market arrangements were changed significantly in the future.
10. The Authority has raised its concerns about the merger of Verve Energy and Synergy and the implications on the effectiveness of the WEM in its previous reports to the Minister for Energy. Given that the merger is unlikely to reduce the current level of market dominance by Verve Energy and Synergy, the need for market power mitigation measures will continue and potentially increase.

1.3 The Wholesale Electricity Market

11. The WEM established in Western Australia covers only the South West Interconnected System (**SWIS**)⁶ and consists of an energy market and a capacity mechanism. The implementation of the WEM is aimed at providing a trading platform, at the wholesale level, for competing generators and retailers, for the purpose of encouraging more private investment and competition, and delivering efficient electricity prices to consumers.
12. The SWIS is an isolated, self-contained system with no interconnections with other electricity systems. This characteristic requires that sufficient capacity must be available to satisfy demand and deal with emergency situations. Hence, system security and supply adequacy were a major consideration in the market design and led to the inclusion of a Reserve Capacity Mechanism (**RCM**). The RCM serves two

⁴ These submissions are available on the ERA website. <http://www.erawa.com.au/markets/electricity-markets/review-of-methodology-for-setting-the-maximum-reserve-capacity-price-and-energy-price-limits/>

⁵ On 10 April 2013, the Minister for Energy announced the merger of Verve Energy and Synergy which is to be established as one company by 1 January 2014. A single board of directors was implemented on 1 July 2013. The relevant legislation is being developed to enable the two entities to trade as a single company.

⁶ The SWIS is the primary electricity grid in Western Australia which supplies the bulk of the South-West region and covers a very large area of 261,000 square kilometres, extending from Albany in the South, to Kalgoorlie in the East and up to Kalbarri in the North.

main purposes: firstly, to facilitate investment, particularly in peaking capacity to meet the system capacity requirement; and secondly, to constrain energy price volatility, i.e. to avoid excessive price spikes, as a result of scarcity pricing, observed in energy only markets, such as the National Electricity Market (**NEM**).⁷

13. The MRCP and EPLs represent the price limits for the capacity mechanism and the energy market, respectively.
14. The energy market in the WEM consists of a day-ahead market, i.e. the STEM, and a close to real time market, i.e. the Balancing Market. The establishment of the STEM and the Balancing Market provides a platform for buyers and sellers to trade energy competitively through an open market.
15. All market participants can trade in the STEM. The STEM is cleared for each Trading Day (48 Trading Intervals)⁸ on the day before the Trading Day commences.
16. The Balancing Market was implemented on 1 July 2012 which allows all generators to compete for the provision of balancing energy. Prior to that, Verve Energy was the sole provider of balancing energy. The Balancing Market clears two hours prior to a Trading Interval commencing.
17. Trading in the STEM and the Balancing Market is supplementary to bilateral contracting in the WEM. Energy traded through the STEM and the Balancing Market currently accounts for approximately 15 to 20 per cent of all energy transactions in the WEM. The majority of energy trading (80 to 85 per cent) is conducted bilaterally under terms and conditions that are confidential.
18. Submissions of offers to both the STEM and the Balancing Market are subject to the price constraints set by the EPLs, i.e. offers must be priced within the range of the EPLs that define the minimum price and the maximum prices.
19. The EPLs in the WEM comprise one minimum price (known as the Minimum STEM Price) and two maximum prices: one for non-liquid (gas) fuelled generators (known as the Maximum STEM Price) and one for liquid (distillate) fuelled generators (known as the Alternative Maximum STEM Price).
20. The adoption of two upper price limits instead of one recognises that the short term operating costs associated with the two relevant fuel types can be significantly different and the concern that some gas fuelled generators may be able to exercise market power if only one price limit, i.e. the Alternative Maximum STEM Price applied, leading to higher price outcomes than otherwise would occur.⁹
21. The Minimum STEM Price sets the floor price for energy offered into the STEM and the Balancing Market. Until 30 June 2012, the Minimum STEM Price had been set as the negative value of the Maximum STEM Price for the same period. As part of the implementation of the new Balancing Market, the Minimum STEM Price was

⁷ The National Electricity Market (NEM) is a wholesale electricity market with operations currently based in five interconnected regions – Queensland, New South Wales, Tasmania, Victoria and South Australia.

⁸ Trading Day is a period of 24 hours commencing at 8:00 AM on any day after Energy Market Commencement, except where the IMO declares that part of a Trading Day is to be treated as a full Trading Day under clause 9.1.1, in which case that part is a Trading Day. Trading Interval is a period of 30 minutes commencing on the hour or half-hour during a Trading Day.

⁹ The maximum price for energy is \$305/MWh for gas fuelled generators from July 2013, and \$500/MWh for distillate fuelled generators for the month of August 2013.

changed to negative \$1,000 per megawatt hour (MWh) as a hard-coded value in the Market Rules.

22. The RCM is designed to ensure sufficient capacity is procured for the market two year in advance. The IMO is responsible for operating the Reserve Capacity Cycle.¹⁰ The cycle of events includes: advertising a Request for Expression of Interest for potential capacity providers; publishing the Statement of Opportunities (**SOO**) Report, in which the system capacity requirement (i.e. the Reserve Capacity Requirement (**RCR**)) will be set two years in advance, in accordance with the Planning Criterion;¹¹ assigning Certified Reserve Capacity to applicants; determining whether a Reserve Capacity Auction is required in order to meet the RCR; then running the Reserve Capacity Auction if the auction proceeds.
23. Reserve Capacity Offers to the Reserve Capacity Auction must be priced between zero and the MRCP.¹² Since the commencement of the WEM, no Reserve Capacity Auction has been held as there has always been sufficient capacity to meet the capacity requirement without the need for an auction.
24. In relation to the provision of ancillary services in the WEM,¹³ a market for LFAS was implemented from 1 July 2012 where all generators can compete for the provision of this service. Prior to that, Verve Energy was the sole default provider for the service. Verve Energy has remained as the sole default provider for the Spinning Reserve Ancillary Service. Other Ancillary Services in the WEM are provided under contractual arrangements between System Management, the power system operator, and the service providers.

1.4 Role of the IMO and the Authority in relation to the price limits

25. The Market Rules require that the IMO carry out a review of the values for the MRCP and EPLs on an annual basis. Where the IMO considers that a revised value is appropriate, the Market Rules require the IMO to submit its proposed revised value to the Authority for approval. Accordingly, the Authority provides regulatory oversight in the determination of the values for the MRCP and EPLs on an annual basis.
26. The role and responsibilities of the IMO and the Authority are set out in the Market Rules for the annual review process. The flowchart below shows the current roles of the IMO and the Authority in relation to the annual review of the EPLs.

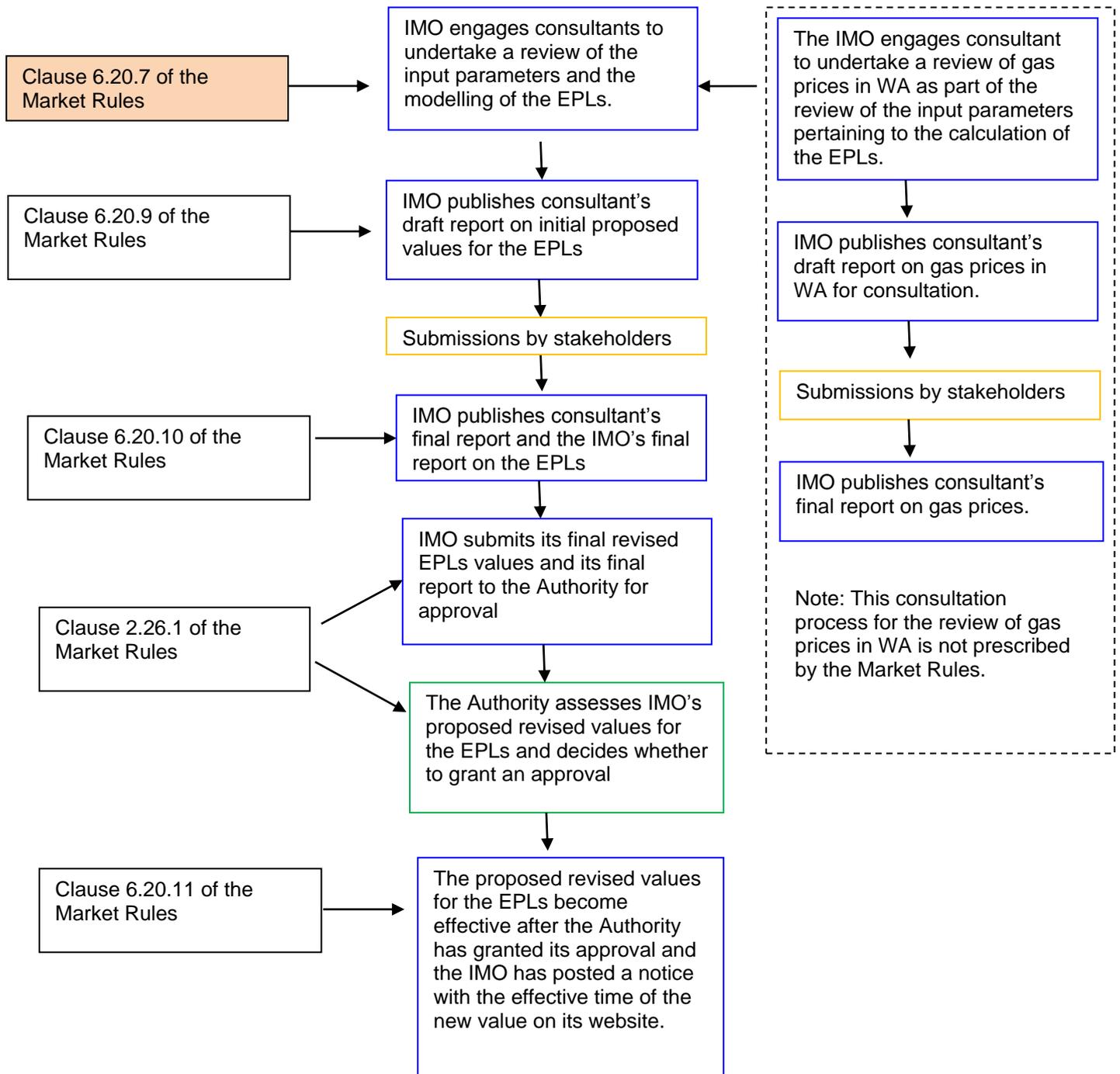
¹⁰ A Reserve Capacity Cycle extends over four calendar years. Refer to clause 4.1 of the Market Rules for more detail.

¹¹ For further detail on the Planning Criterion for setting the RCR, refer to clause 4.5.9 of the Market Rules.

¹² Refer to clause 4.18.2 of the Market Rules.

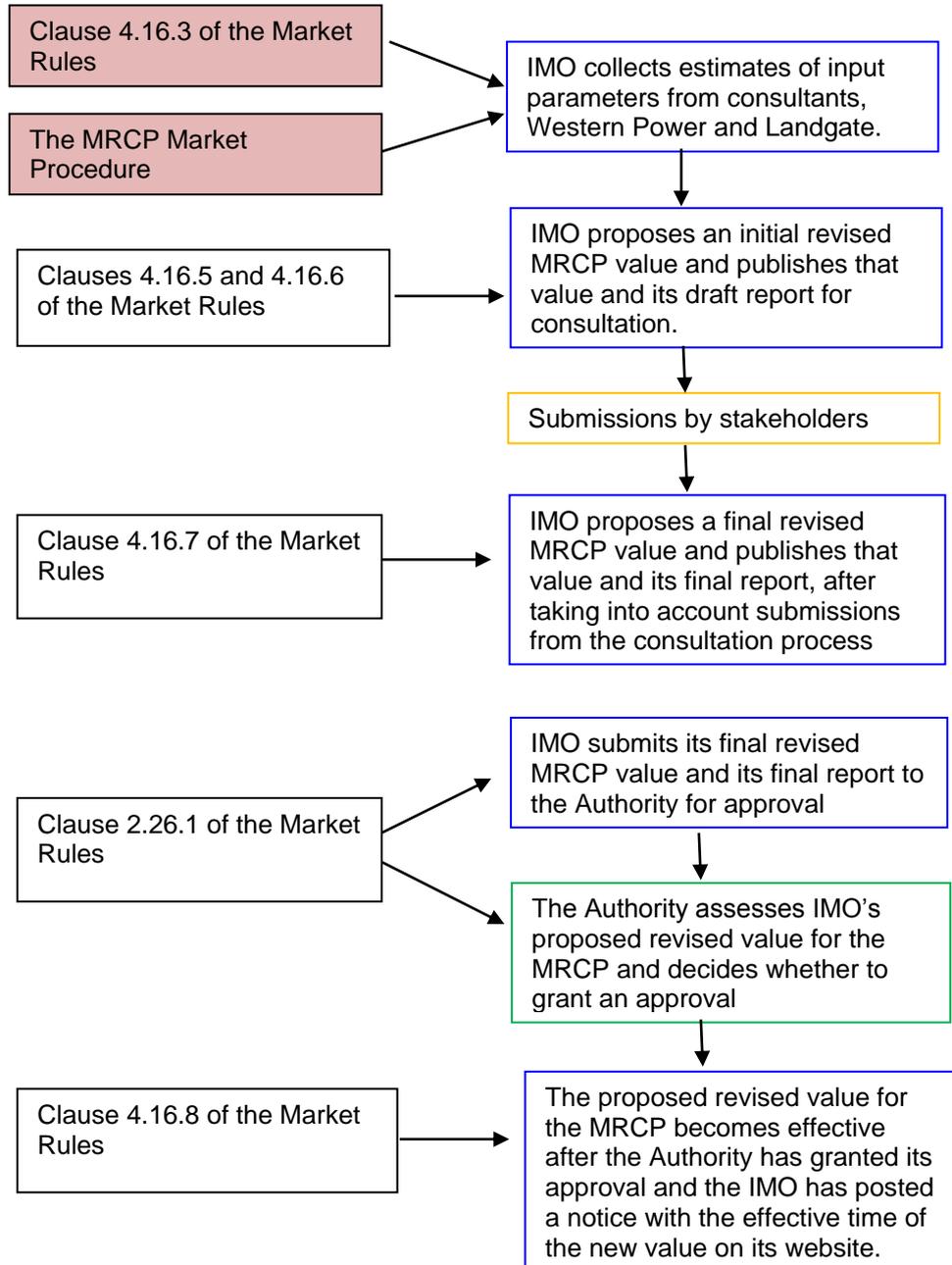
¹³ These services include load following service, spinning reserve service, load rejection reserve service, system restart service and dispatch support service. Refer to clause 3.9 of the Market Rules for further detail.

Figure 1 Flowchart on the current roles of the IMO and the Authority in relation to the annual review of the EPLs



27. The flowchart below illustrates the current roles of the IMO and the Authority in relation to the annual review of the MRCP.

Figure 2 Flowchart on the current roles of the IMO and the Authority in relation to the annual review of the MRCP



28. In addition to the above annual requirements, the Market Rules require that the Authority undertake a review of the methodology for setting the MRCP and the EPLs every five years. This relates to the relevant clauses in the Market Rules and the relevant Market Procedure, referred to in the shaded boxes presented in the two flow charts above, which define the methodology for recalculating the MRCP and the EPLs each year.
29. In relation to the review of the methodology for setting the MRCP, the Market Rules require the Authority to review the appropriateness of the parameters and methodology in the Market Rules and the Market Procedure for recalculating the MRCP. The Market Rules also include a requirement for the IMO to review the MRCP Market Procedure outlining the methodology and processes for calculating the MRCP, at least every five years. This appears to have caused some confusion as to the roles of the Authority and the IMO in undertaking the methodology review for setting the MRCP.
30. The Authority notes that there is no requirement in the Market Rules for the IMO to develop Market Procedures or review the methodology for setting the EPLs.
31. The Authority considers that the primary role of the Authority in the WEM is the provision of regulatory oversight to ensure the effective and efficient operation of the market. Consistent with this understanding, the Authority considers it is appropriate to focus this review on the appropriateness of the key concepts and principles underlying the methodology for setting the MRCP and EPLs, and whether further clarity is required to be included in the Market Rules which can then flow into the development and/or review of the relevant Market Procedures.
32. Should the Minister accept the Authority's recommendations in this review, it is the IMO's role to ensure that these principles are implemented and reflected in the Market Rules and the relevant Market Procedures. There should be no overlap in the roles of the Authority and the IMO.

1.5 Structure of this report

33. This report is structured as follows:
 - Chapter 2 summarises the Authority's assessment of the level of competition in the WEM, the level of market power being exercised and the potential for the exercise of market power;
 - Chapter 3 sets out the Authority's assessment of the current methodology for setting the EPLs and the effectiveness of this methodology in curbing the use of market power; and
 - Chapter 4 sets out the Authority's assessment of the current methodology for setting the MRCP and the effectiveness of this methodology in curbing the use of market power.

2 Competition and market power in the WEM

34. Clause 2.26.3 of the Market Rules requires that the Authority's review must examine: (a) the level of competition in the market; (b) the level of market power being exercised and the potential for the exercise of market power; among other things. This chapter fulfils these two obligations.
35. Competition generally refers to the rivalry process between companies, where each company is constrained in its price and output decisions by the market activities and the responses of other companies in the market.¹⁴
36. The process of competition is widely accepted as a means of facilitating the delivery of economic efficiency and innovation. Where effective competition is present, unnecessary regulatory interventions can impede competition and distort prices.¹⁵ Hence, an assessment of the level of competition in the market is relevant for the purpose of determining the level of regulatory intervention required in order to mitigate market power.
37. Competition in a market can exist along a spectrum of different levels: from monopoly at one extreme, to perfect competition at the other extreme. A monopoly market refers to a market of one seller who can set the price. A perfectly competitive market refers to a market with a large number of sellers whereby each seller has no ability to influence the market price. Between these extremes, competitive pressures from new entrants can act to limit an incumbent company's market power and move the market towards effective or workable competition.¹⁶
38. There are various definitions and interpretations of market power. A commonly used definition of market power refers to the ability of a company to charge prices above competitive levels or restrict output or quality below competitive levels. Consequently, the company is able to earn a profit that is above the normal economic profit.¹⁷
39. The degree of market power of a company can be substantial and sustained over a considerable period of time.¹⁸ In this situation, the company's exercise of market power can have a greater influence on market outcomes.
40. A recent Australian Energy Market Commission (**AEMC**) study on market power in the NEM found that substantial market power can lead to allocative inefficiency, where a sub-optimal level of electricity is produced and consumed, and to productive inefficiency where more expensive generation is dispatched. This can also result in higher retail prices as higher wholesale prices will eventually flow through to consumers. Substantial market power may also adversely affect dynamic efficiency that prevents the adoption of new technology and innovation.¹⁹

¹⁴ AEMC, *Review of the Effectiveness of Competition in the ACT Electricity Retail Market - Revised Statement of Approach*, 2009, p.5.

¹⁵ Organisation for Economic Co-Operation and Development (OECD), *Competition Assessment Toolkit, Volume II: Guidance (Version 2.0)*, 2011, p. 10.

¹⁶ AEMC, *Review of the Effectiveness of Competition in the ACT Electricity Retail Market - Revised Statement of Approach*, 2009, p.6.

¹⁷ Office of Fair Trading (UK), *Assessment of market power – Understanding competition law*, 2004, p. 9.

¹⁸ OECD, *Policy Brief, Substantial Market Power and Competition*, 2008. See <http://www.oecd.org/regreform/sectors/41257462.pdf>

¹⁹ AEMC, *Potential Generator Market Power in the NEM - Final Rule Determination*, 2013.

41. For an electricity market, the exercise of market power does not apply only to the largest generators in the market. Hope (2005) suggests that “...under some circumstances, even a relatively small electric power producer, when being a marginal producer, with a market share far below what is generally considered to qualify for unilateral market dominance in competition policy, may be in a “dominant” position to exercise market power to the detriment of economic efficiency”.²⁰

2.1 Assessment of competition

42. In examining the level of competition in the WEM, the Authority has considered the commonly used framework for analysing effective competition that includes the assessment of three aspects of a market, i.e. market structure, market conduct and market performance. For the purpose of this review, the Authority has focused mainly on the aspect of market structure as it is the fundamental issue in the WEM.
43. The structure of a market has significant influences on the dynamic process of competition and the rivalry among generators. This relates to the number of participants in the market, the relative market shares of each participant and the extent of barriers to new entry and exit.

2.1.1 Market participants and their relative market shares

44. Since the commencement of the WEM, there has been a noticeable increase in the number of participants registered with the IMO for participating in the WEM. As at 10 December 2012, there was a total of 60 registered participants (excluding network operators), including:
- 34 entities registered as Market Generators only.
 - 15 entities registered as Market Customers only.
 - 11 entities registered as both Market Generators and Market Customers.

This compares to the total number of registered participants of 30 as at 2 September 2008.²¹

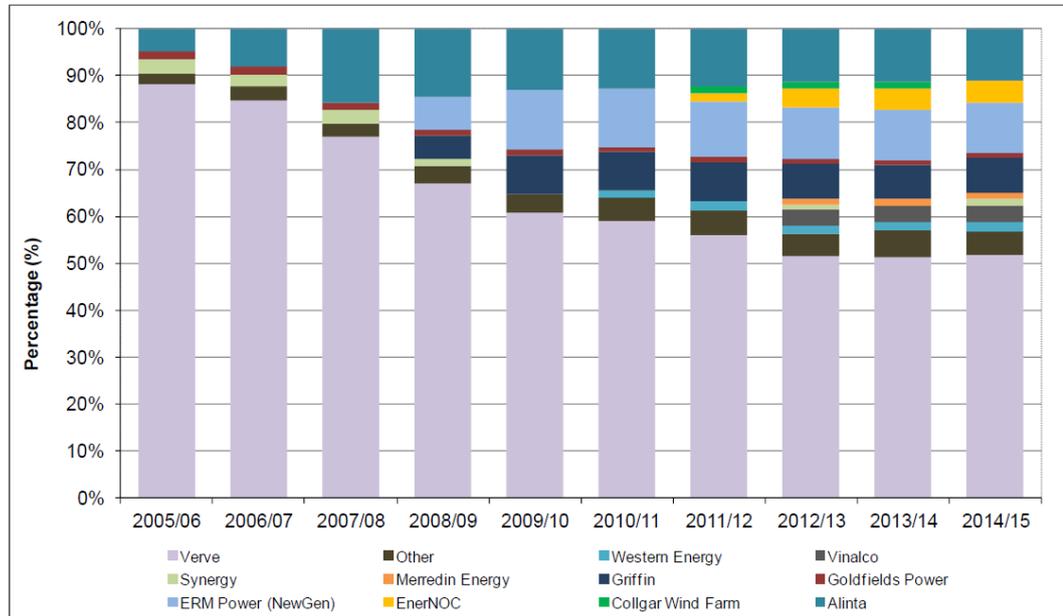
45. On the supply side, both generators and Demand Side Management (**DSM**) providers can participate in the supply of capacity and receive Capacity Credits allocated by the IMO which enables them to receive payments for their capacity. Figure 3 below provides a summary of Capacity Credits allocated by the IMO to each capacity provider, in relative percentage terms, since the start of the WEM.
46. As can be seen from Figure 3, there was only a limited number of capacity providers when the market started in September 2006. The number of Capacity Credits held by Verve Energy, the State-owned generator, was close to 90 per cent.
47. Over the years, a number of new generators and DSM providers have entered the market. These include Griffin Energy (with two coal fired generation units in the Collie region of Western Australia, represented by the dark blue bar in the chart), ERM Power (NewGen) (with gas fired generation units located in Kwinana and Neerabup, represented by the light blue bar in the chart), and more recently

²⁰ Einar Hope (2005), “Market Dominance and Market Power in Electric Power Markets”, Report 3/2005, Swedish Competition Authority.

²¹ Refer to Table 17 of ERA 2012 Wholesale Electricity Market Report to the Minister for Energy.

EnerNOC, a DSM aggregator with a noticeable increase in its relative share (represented by the yellow coloured bar in the chart). As a result, the relative share of Capacity Credits held by Verve Energy (represented by the light purple bar in the chart) is expected to reduce to around 50 per cent in the 2014/15 Capacity Year.²²

Figure 3 Capacity Credits by Market Participants



Source: The IMO.

48. Whilst the trend of development in the market has been positive, the Authority considers that a market which has one dominant participant, with a relative share of over 50 per cent, represents a large degree of market concentration, causing concerns of market power: the potential use of market power and the potential for detrimental impacts on consumers.
49. On the demand side, Synergy, the State-owned retailer, has been the dominant Market Customer that purchases electricity (energy and capacity) through either bilateral contracts or market transactions in the WEM. In addition to the contractual arrangements with Verve Energy, Synergy is also the substantial counter party that procures electricity supply from Griffin Energy and NewGen under bilateral contractual arrangements. Generation capacity linked to Synergy is estimated at close to 80 per cent of the total market.²³

2.1.2 Barriers to new entry

50. The ability of new participants to enter the market is critical in maintaining sustained competitive pressure on the incumbent companies in the market and in ensuring efficient market outcomes. Whilst there has been a noticeable increase in the number of participants in the WEM, the Authority considers the barrier to entry is still relatively high due to a number of structural impediments.

²² Verve Energy is also the effective operator of the facilities (also known as Muja A and B units, previously mothballed by Verve Energy) registered under Vinaco.

²³ Mark Chatfield, presentation at WA Energy Conference 2012.

51. **Policy environment.** Whilst the WEM is a highly concentrated market with the continuing dominance of Synergy and Verve Energy, competition in the market has been also influenced by policy decisions in the retail market. Setting electricity tariffs below cost-reflective levels limits the ability of other retailers to compete with Synergy for the supply to “contestable customers” that are staying on these tariffs.²⁴ Without full retail contestability and allowing only Synergy to supply “non-contestable customers”, existing retailers other than Synergy are restricted from achieving critical economies of scale. The entry and expansion of new retailers is likely to be delayed as well. Both of these outcomes will have adverse implications for the prospect of new entrant generation and implications for the competitiveness, liquidity and efficiency of the WEM.
52. **Vesting Contract.** As part of the disaggregation of the former Western Power into four separate entities, i.e. Synergy, Verve Energy, Western Power (network) and Horizon Power, a vesting contract between Synergy and Verve Energy was put into place, ensuring that the majority of Synergy’s supply requirements are met by Verve Energy, which in turn receives revenue from Synergy, with some degree of certainty. The initial vesting contract included a displacement mechanism, which required Synergy to procure its electricity supply through an open and competitive tender process in which Verve Energy could participate as well. Investment in generation capacity by new entrants has been brought to the market, in part, as a result of Synergy’s displacement mechanism. However, this displacement mechanism was abolished when the vesting contract was revised in 2010 which potentially limits the opportunities for new entrants to enter the market.²⁵
53. **Limitations in bilateral contracting.** Given the dominance of Synergy in the retail market and the limited number of other retailers of material scope with recognisable credit rating records in the market, the ability for a new entry generator to negotiate off-take agreements is constrained. This is particularly the case for a new base-load generator which often requires substantial capital investment and the support of a bilateral contract with a retailer.
54. **Complexity of the market.** The Authority, in its 2012 WEM report to the Minister for Energy, noted the concerns expressed by stakeholders that the complexity of the WEM, including the Market Rules that govern the RCM and energy market, as well as contractual arrangements between the State-owned corporations, can be barriers to new entry to the market.²⁶
55. **Unconstrained network regime.** The WEM design is based on an unconstrained network access concept which allows generators to have full access to the network during times of peak electricity demand, even after a single credible network fault.²⁷

²⁴ Contestable customers refer to customers with annual electricity consumption of more than 50 MWh. These customers are free to choose their retailer in the SWIS.

²⁵ In its 2010 WEM Report to the Minister, the Authority specifically commented on the revised contract between Synergy and Verve Energy, known as the Replacement Vesting Contract, which was put in place in 2010. The Authority noted that the Replacement Vesting Contract lacks the pro-competitive features included in the original Vesting Contract, in particular the displacement mechanism and the associated information provision by Synergy to the market, i.e. the Displacement Statement of Opportunities. Recognising a significant proportion of new generation investment has been effectively underwritten by Synergy under the displacement mechanism, the Authority considers this change will affect further private investment in electricity generation in the SWIS as there is no such mechanism for private sector generation to tender for Synergy’s load under the Replacement Vesting Contract.

²⁶ Economic Regulation Authority, 2012 Wholesale Electricity Market Report to the Minister for Energy, p. 56.

²⁷ The unconstrained access approach to the network in the SWIS is implemented through Western power’s role in making access offers for transmission services and its interpretation and application of the Technical Rules which consist of the standards, procedures and planning criteria governing the construction and

An unconstrained network approach facilitates simpler operation of the power system and market because of the absence of dynamic physical constraints.²⁸ However, as noted in previous reports to the Minister for Energy, the Authority considers that the requirement for unconstrained network access creates a barrier to entry, as new entrant generators must pay a proportion of the costs of the next network augmentation. As the network is considered to be close to its capacity, this cost can be prohibitively high even for small increments of generation. In addition, the process for obtaining access to the network can also be lengthy and costly.

56. Based on the above analysis, the Authority considers that even though there has been a noticeable increase in the number of market participants in the WEM, the level of concentration is still high and barriers to entry continue to be a matter of concern in the market place.

Finding 1

Section 2.1

The level of market concentration in the WEM remains relatively high, exposing the WEM to the potential misuse of market power, with consequential inefficient market outcomes and detrimental effects to consumers.

2.2 Assessment of the use and potential use of market power

57. In addition to setting price limits for market power mitigation, the design of the WEM also included a cost based bidding requirement when such behaviour relates to market power. Specifically, the Market Rules require a generator to price its offers in the STEM to reflect its reasonable expectation of the SRMC for generating the relevant electricity when such behaviour relates to market power.²⁹ A generator is also required to price its offers in the Balancing Market so as not to exceed its reasonable expectation of the SRMC for generating the relevant electricity when such behaviour relates to market power.³⁰ For participation in the LFAS market, a generator is prohibited to offer prices in excess of its reasonable expectation of the incremental change in the SRMC incurred by the facility providing LFAS when such behaviour relates to market power.³¹
58. Under the Market Rules, the Authority, with the assistance of the IMO, must monitor instances of inappropriate and anomalous market behaviour in relation to bidding in the STEM, the Balancing Market and the LFAS market. To date, the Authority has not initiated any formal investigation based on observed evidence of behaviour in relation to the exercise of market power.

operation of an electricity network and deal with all matters listed in Appendix 6 of the *Electricity Networks Access Code 2004*.

²⁸ 'Physical constraints' are limitations on the operation of a network asset, a group of assets or a whole area of the network due to performance requirements across a range of factors including power quality, security of supply, safety and power system stability.

²⁹ Refer to clause 6.6.3 of the Market Rules.

³⁰ Refer to clause 7A.2.17 of the Market Rules.

³¹ Refer to clause 7B.2.15 of the Market Rules.

Verve Energy and Synergy merger

59. Vertical integration between a generator and retailer, creating a gentailer, can provide efficiency gains and commercial benefits.³² However, whether this provides any positive outcomes for the market as a whole depends on a number of factors. Vertical integration can have anti-competitive effects on the market by creating a company of substantial market power or increase market power already enjoyed by the separate companies.³³ In addition, any cost savings achieved by the new gentailer will only deliver savings to consumers if these cost savings are passed on.
60. Currently Verve Energy and Synergy control the largest share of the market for both generation and retailing in the WEM. Merging these entities is unlikely to lead to a reduction in market share. A possible outcome is that the merger will further increase the level of concentration in the market, with adverse implications for competition, transparency and confidence of private investors.³⁴
61. Under the existing Market Rules, facilities owned by Verve Energy are allowed to be offered, on a portfolio basis, in the STEM, the Balancing Market and the LFAS market. Whilst portfolio based bidding is allowed for all market participants in the STEM, Verve Energy is the only participant that is allowed to price its offers on a portfolio basis in the Balancing Market and the LFAS market. Other generators must offer by each facility for Balancing and LFAS.
62. The SRMC of a portfolio of generators may differ from the SRMC of any particular generation facility. Portfolio-based bidding results in a lack of transparency as to how Verve Energy prices its offers at the facility level.³⁵ This lack of transparency increases the potential for market power being exercised. Given the dominant position of Verve Energy, which may increase as a result of the merger, the Authority considers that the current arrangements for Verve Energy's bidding requirements should be reviewed.
63. The Authority recommends that consideration be given to requiring Verve Energy to price its offers on a facility basis: in the energy market (i.e. the STEM and the Balancing Market), consistent with that facility's SRMC; and in the LFAS market, to reflect the incremental change in the SRMC of the facility that provides LFAS. This will increase transparency in the market and reduce the likelihood of any exercise of market power.

³² Economic Regulation Authority, *Report on Prohibition and Restriction on Synergy and Verve Energy*, 2011, page 6.

<http://www.erawa.com.au/cproot/11251/2/20130328%20D62747.2%20-%20Prohibition%20and%20Restriction%20on%20Synergy%20and%20Verve%20Energy%20under%20the%20Electricity%20Corporations%20Act%202005%20-%20Final%20Report.pdf>

³³ OECD, *A Framework for the Design and Implementation of Competition Law and Policy*, <http://www.oecd.org/daf/competition/prosecutionandlawenforcement/27122278.pdf>

³⁴ In the 2008 WEM report to the Minister for Energy, in reference to a consideration of merging the two entities, the Authority noted "that the existence of such a dominant gentailer in the WEM would destroy effective competition tension in the market with adverse impacts on efficiency". See <http://www.erawa.com.au/cproot/7178/2/20081218%20D0810616%202008%20Annual%20WEM%20Report%20for%20the%20Minister%20for%20Energy%20-%20Public%20Version.pdf>

³⁵ The SRMC of a portfolio of generators may differ from the SRMC of any particular generation facility. Refer to Economic Regulation Authority, *Portfolio Short Run Marginal Cost of Electricity Supply in Half Hour Trading Intervals-Technical Paper*, 11 January 2008.

Recommendation 1

Section 2.2

Consideration should be given to require Verve Energy to price its offers on an individual facility basis: to the STEM and the Balancing Market, consistent with that facility's SRMC; and to the LFAS market, to reflect the incremental change in the SRMC of the facility providing LFAS, rather than on a portfolio basis as provided by the existing Market Rules.

2.3 Conclusion

64. The Authority notes that greater competition has developed in the WEM since market commencement, particularly on the supply side. However, at present the Authority considers that the extent of market concentration in the WEM is still high and the level of competition is limited. Market power and the potential for market power being exercised remain an on-going concern among participants. Hence, the Authority considers that regulatory intervention will be necessary until such time that further competition in the market evolves and becomes effective.
65. The Authority believes the merger between Verve Energy and Synergy has the potential to further restrict competition and increase the potential for exercise of market power. From this perspective, the Authority recommends that the current arrangements in the Market Rules that enable Verve Energy to bid on a portfolio basis should be reviewed.

3 Methodology for setting the Energy Price Limits

66. Clause 2.26.3 of the Market Rules requires that the Authority's review of the methodology for setting the EPLs must examine:
- the effectiveness of the methodology in curbing the use of market power (clause 2.26.3(c));
 - historical STEM Bids and STEM Offers and the proportion of STEM Bids and Offers with prices equal to the EPLs (clause 2.26.3(e));
 - the appropriateness of the parameters and methodology in clauses 6.20 for recalculating the EPLs (clause 2.26.3(g));
 - the performance of STEM Auctions and Balancing in meeting the Wholesale Market Objectives (clause 2.26.3 (h)); and
 - other matters which the Authority considers relevant; among other things (clause 2.26.3(i)).

This chapter fulfils these obligations under the Market Rules.

3.1 The Role of the Energy Price Limits

67. The price caps for energy trading in the WEM work in conjunction with the SRMC rule which enforces cost-based bidding in the WEM.
68. The WEM includes a separate capacity market that allows the recovery of capital costs to some extent. This has allowed the implementation of energy bidding based on a generator's SRMC in the STEM and the Balancing Market.
69. Setting the price cap to reflect the estimate of the SRMC of the most expensive plant within the system ensures all generators are able to recover their operating costs, which also provides an opportunity for those generators with a lower SRMC to earn profits when the market clears at a price above their own SRMC.

3.1.1 The maximum price limit

70. Setting the price cap (i.e. the Maximum STEM Price and Alternative Maximum STEM Price) at an appropriate level requires balance. The key principle for setting the price cap is that it needs to be low enough to mitigate market power but high enough to ensure it does not deter new investment. Setting price caps too low can dilute the price signal for investment in a market and inhibit innovation.
71. The Market Rules (6.20.7a) i) states that : *the Maximum STEM price, where this is to be based on the IMO's estimate of the short run marginal cost of the highest cost generating works in the SWIS fuelled by natural gas and is to be calculated using the formula in paragraph (b).*
72. The Market Rules (6.20.7a) ii) states that : *the Alternative Maximum STEM price, where this is to be based on the IMO's estimate of the short run marginal cost of the*

highest cost generating works in the SWIS fuelled by distillate and is to be calculated using the formula in paragraph (b).

73. These clauses set the principles for setting the energy price caps in the WEM, that is, they are based on the estimate of the SRMC of the most expensive existing plant in the SWIS.

3.1.2 The minimum price limit

74. A price floor is generally set when there is a concern that the free market will set prices too low resulting in undesirable social outcomes. For example, governments typically set a minimum wage to protect societal values.
75. There is no mention in the Market Rules as to the purpose of having a Minimum STEM Price in terms of market power mitigation.
76. However, the Authority understands it has a number of implications in terms of the operation of the WEM. For example, the Minimum STEM Price can affect the size of constrained off payments of some facilities when they are priced at the Minimum STEM Price.³⁶ It also sets the lowest price at which a Market Participant can offer in Balancing for a facility that is the subject of an operating instruction or undergoing a test to ensure dispatch.³⁷
77. It could be argued that having the price floor in the WEM reduces the potential price volatility in the market and thus creates greater revenue stability for generators.³⁸
78. There is currently no method and process provided in the Market Rules to guide what this price floor should be based on, how often this value should be reviewed and the process that the IMO should follow if such a review is required.
79. Verve Energy is concerned that there seems to have been limited analysis in selecting negative \$1,000/MWh as a hard-coded value for the Minimum STEM Price during the Market Evolution Program, and considers that there would be value in undertaking an analysis as to whether this value or an alternative value is appropriate.
80. Verve Energy notes that the current Market Rules do not explicitly provide for a process for reviewing the Minimum STEM Price. It considers there is value in having a more explicit review process to assess the appropriateness of the value of the Minimum STEM Price in the Market Rules, and that a Rule Change Proposal to this effect may be required. Alinta Energy is also in support of this. Alinta Energy considers the minimum STEM Price provides certainty to generators as to the maximum price they may have to pay to stay on to generate, particularly during the overnight periods.
81. Perth Energy considers that there is no need for a methodology in setting the Minimum STEM Price, as the market operates with an implied self-regulation in that no Market Generators could sustain the price of negative \$1,000/MWh for a long period of time.

³⁶ Refer to clause 6.17.4 of the Market Rules for details on constrained off compensation.

³⁷ Clause 7A.2.3 of the Market Rules.

³⁸ Ben Hobbs, Javier Inon and Steve Stoff, "Installed Capacity Requirements and Price Caps: Oil on the Water, or Fuel on the Fire?", *The Electricity Journal* July 2001

82. For the purposes of mitigating market power, the Authority is of the view that there does not seem to be a reason for the inclusion of a Minimum STEM Price in the WEM. Recognising the need for a minimum price for operational purposes of the market, the Authority recommends that consideration should be given to exploring the costs and benefits of removing the Minimum STEM Price in the WEM.

Recommendation 2

Section 3.1

Consideration should be given to explore the costs and benefits of removing the Minimum STEM Price in the WEM.

3.2 Current methodology for setting the EPLs

83. Currently, clause 6.20 and clause 2.26 of the Market Rules set out the methodology and process for setting the EPLs. The role and responsibilities of the IMO and the Authority are shown in the flowchart in section 1.4.
84. Clause 6.20 of the Market Rules sets the requirements and the steps that must be followed by the IMO for proposing revised values for the EPLs.
85. Clause 2.26 of the Market Rules sets the requirements and the steps that must be followed by the Authority for approving revised values for the EPLs.

3.2.1.1 Requirements under clause 6.20 of the Market Rules

86. Clause 6.20.6 of the Market Rules states that the IMO must annually review the appropriateness of the value of the Maximum STEM Price and Alternative Maximum STEM Price.
87. Under clause 6.20.9 of the Market Rules, the IMO must prepare a Draft Report describing how it has arrived at the proposed revised values for the Maximum STEM Price and the Alternative Maximum STEM Price. The IMO must publish the Draft Report on the market website and advertise the report in newspapers widely distributed in Western Australia. It must request submissions from all sectors of the Western Australian energy industry, including end-users, within six weeks of the date of publication.
88. Clause 6.20.7 of the Market Rules states that the IMO may propose the Maximum STEM Price, which is to be based on the IMO's estimate of the SRMC of the highest cost generating works in the SWIS fuelled by natural gas; and the Alternative Maximum STEM Price, which is to be based on the IMO's estimate of the SRMC of the highest cost generating works in the SWIS fuelled by distillate.
89. Clause 6.20.7 (b) of the Market Rules sets out the following formula that the IMO must use in calculating the Maximum STEM Price or Alternative Maximum STEM Price:

$$(1 + \text{Risk Margin}) \times (\text{Variable O\&M} + (\text{Heat Rate} \times \text{Fuel Cost})) / \text{Loss Factor}$$

Where:

- Risk Margin is a measure of uncertainty in the assessment of the mean short run average cost for a 40MW open cycle gas turbine generating station expressed as a fraction;
 - Variable O&M is the variable operating and maintenance costs for a 40 MW open cycle gas turbine generating station expressed in \$/MWh, and includes, but is not limited to, start-up related costs;
 - Heat Rate is the mean heat rate at minimum capacity for a 40 MW open cycle gas turbine generating station, expressed in GJ/MWh;
 - Fuel Cost is the mean unit fixed and variable fuel cost for a 40 MW open cycle gas turbine generating station, expressed in \$/GJ; and
 - Loss Factor is the marginal loss factor for a 40MW open cycle gas turbine generating station relative to the Reference Node.
90. The current methodology requires that the IMO must determine appropriate values for the factors in the equation under clause 6.20.7 as applicable to the Maximum STEM Price and Alternative Maximum STEM Price.
91. To determine appropriate values for the factors in the equation under clause 6.20.7, the IMO has been engaging consultant SKM to identify the likely variability in key inputs (Variable O&M, Heat Rate and Fuel Cost) to the calculation of EPLs, and model the impact that the variability in the key inputs would have on the dispatch cycle cost of the reference unit. This method results in a probability distribution of possible costs from which the EPLs are selected to cover 80 per cent of the possible outcomes.³⁹
92. Under clause 6.20.10 of the Market Rules, after considering the submissions on the Draft Report described in clause 6.20.9 of the Market Rules, the IMO must propose a final revised value for any proposed change to the EPLs and publish these values in its Final Report, including submissions received on the Draft Report, on the market website.
93. Under clause 6.20.11 of the Market Rules, a proposed revised value for any EPL replaces the previous value after the Authority has approved the value in accordance with clause 2.26 of the Market Rules, and the IMO has posted a notice on the market website of the new value of the applicable EPL with effect from the time specified in the IMO's notice.

3.2.1.2 Requirements under clause 2.26

94. Currently, under clause 2.26.1 of the Market Rules, where the IMO has proposed a change in the value of one or more EPLs in accordance with clause 6.20 of the Market Rules, the Authority must review the report provided by the IMO, including all

³⁹ In the 2010 EPLs review, the IMO amended the method to calculate the Alternative Maximum STEM Price where it resulted in a probability distribution of possible costs from which the Alternative Maximum STEM Price was modelled to cover 80 per cent of the possible outcomes. Prior to the 2010 EPLs review, the Alternative Maximum STEM Price was modelled to cover 90 per cent of the possible outcomes. The IMO's decision was made on the basis that the reduction would not constrain market operations when liquid fuel is required; would correct for the previous over-estimation of the cost of extreme peaking service with Liquid Fuel; and remove a current discrimination between gas and liquid fired technologies. See IMO website, Final Report on Review of EPLs for the WEM in the SWIS, 9 September 2010, http://www.imowa.com.au/f2354,1608657/The_IMO_s_Final_Report_Energy_Price_Limit_2010.pdf

submissions received by the IMO in preparation of the report, and make a decision as to whether or not to approve the revised value(s) comprising the EPLs.

95. In making its decision, the Market Rules stipulate that the Authority must only consider whether the revised value(s) for the EPLs proposed by the IMO reasonably reflects the application of the method and guiding principles described in clause 6.20 of the Market Rules and whether the IMO has carried out an adequate public consultation process. The Authority must then notify the IMO as to whether or not it has approved the revised value(s).
96. Alinta Energy and Verve Energy consider that the regulatory oversight contemplated by clauses 2.26 of the Market Rules is appropriate and that any amendment to these rules would likely lead to duplication of work between the IMO and the Authority.
97. The Authority considers that the current regulatory oversight requirements on the annual review of the EPLs under the Market Rules are appropriate and adequate.

3.3 Historical STEM Bids and STEM Offers and the proportion of STEM Bids and Offers with prices equal to the EPLs

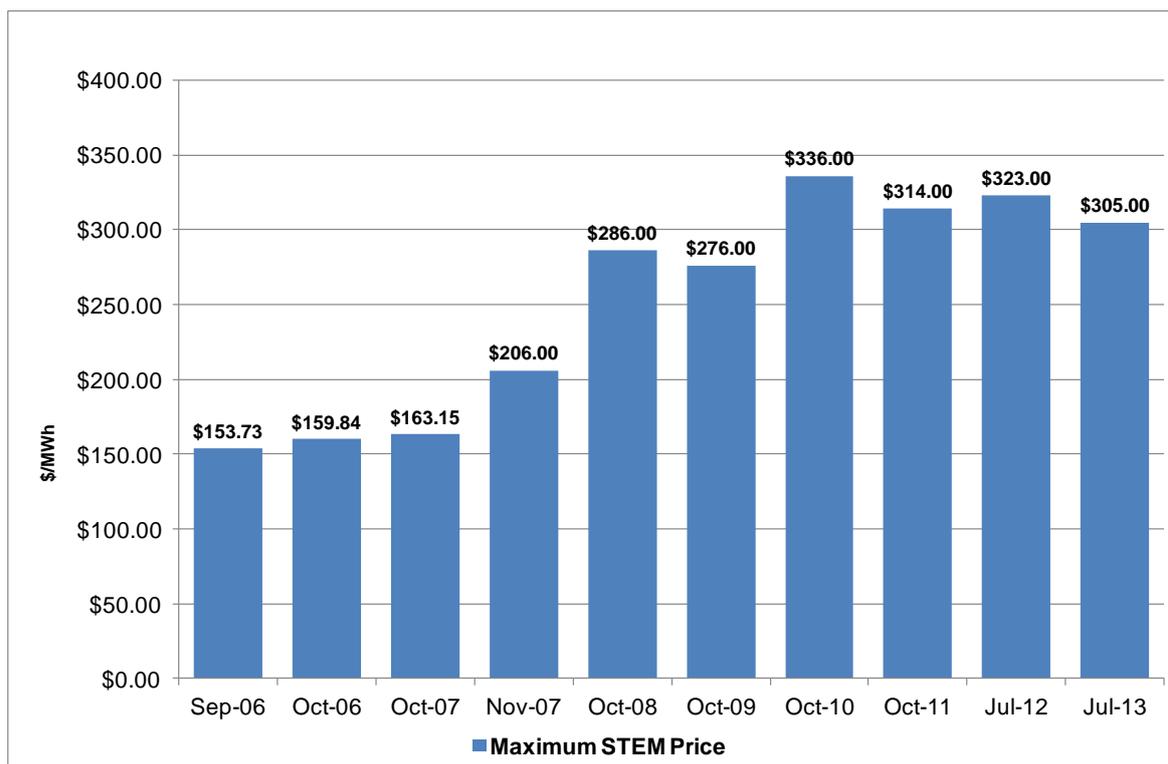
98. Clause 2.26.3 (e) of the Market Rules provides that the Authority's review must examine historical STEM Bids⁴⁰ and STEM Offers⁴¹ and the proportion of STEM Bids and Offers with prices equal to the Energy Price Limits. This section fulfils this requirement.

3.3.1 Historical Maximum STEM Price

99. Generation capacity not running on liquid fuel must be priced at or below the Maximum STEM Price. The Market Rules specify that the Maximum STEM Price is adjusted annually subject to review by the IMO. The chart below illustrates the movement of the historical Maximum STEM price.

⁴⁰ A STEM Bid is a bid to purchase energy from the IMO via the STEM Auction for a Trading Interval.

⁴¹ A STEM Offer is an offer to provide energy through the STEM auction for a Trading Interval determined by the IMO in accordance with clause 6.9.3 of the Market Rules.

Figure 4 Movement of the historical Maximum STEM price

100. Several factors have caused an increase to the Maximum STEM Price since market commencement. These include increases in the prices of gas; the change to basing the gas price on the spot gas price in calculating the Maximum STEM Price; and the commencement of operation of the new high efficiency gas turbines at Kwinana in September 2012.⁴²

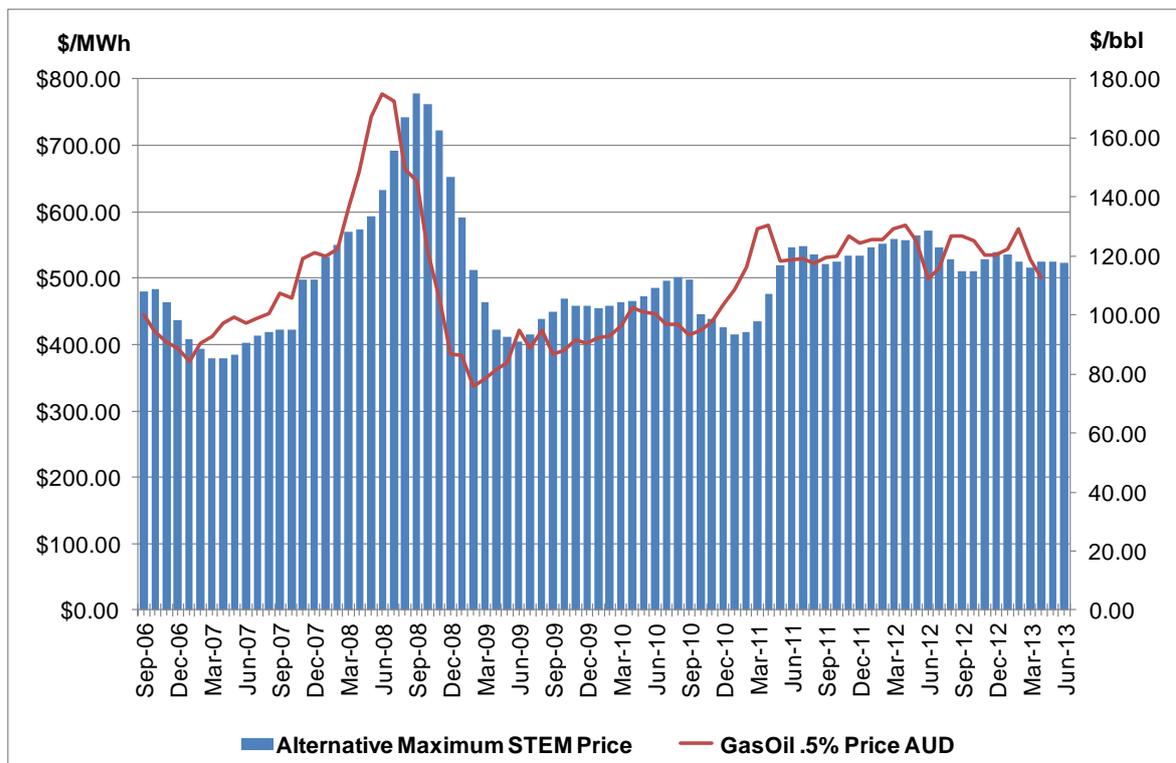
3.3.2 Historical Alternative Maximum STEM Price

101. Generation facilities running on liquid fuel must not be priced above the Alternative Maximum STEM Price. The Market Rules specify that the Alternative Maximum STEM Price is adjusted monthly to reflect changes in oil prices and the Consumer Price Index (CPI), and is subject to review by the IMO. In the current methodology, the price of Singapore Gas Oil (0.5% sulphur) is used in the calculation of the Alternative Maximum STEM Price.
102. Figure 5 below illustrates the movement of the historical Alternative Maximum STEM Price and the Singapore Gas Oil (0.5% sulphur) price since market commencement. The key driver for changes in the Alternative Maximum STEM Price is changes in oil

⁴² The key driver for the increase in the Maximum STEM Price in 2007 and 2008 was the increase in the price of gas in Western Australia. The increase in the Maximum STEM Price in 2010 was primarily due to the change to base the gas price on the spot gas price (the gas price was based on contract price prior to the 2010 review). The decrease in the Maximum STEM Price in the 2013 Energy Price Limits review was related to the commencement of operation of the new high efficiency gas turbines at Kwinana in September 2012 which caused a reduced maintenance requirement on the Pinjar machines (determined by the IMO as the highest cost generating works in the SWIS). The Pinjar machines are dual fuel facilities.

prices.⁴³ There have also been other reasons for changes in the Alternative Maximum STEM Prices.⁴⁴

Figure 5 Movement of the historical Alternative Maximum STEM price



3.3.3 Instances of STEM Clearing Prices equal to the Energy Price Limits

103. The figure below shows the proportion of Peak and Off-Peak Trading Intervals⁴⁵ during which STEM Clearing Prices were at the Maximum STEM Price (per calendar month) from market commencement to 30 April 2013. There were some incidences of STEM Clearing Prices reaching the Maximum STEM Price at the beginning of the market in late 2006. Since then, the highest incidence of both Peak and Off-Peak STEM Clearing Prices reaching the Maximum STEM Price occurred between June and September 2008, which coincided with the Varanus Island incident.⁴⁶ STEM

⁴³ The chart shows a lag between the gas oil price and the Alternative Maximum STEM Price. This is a result of the way the Alternative Maximum STEM Price is calculated based on the gas oil price in the Market Rules.

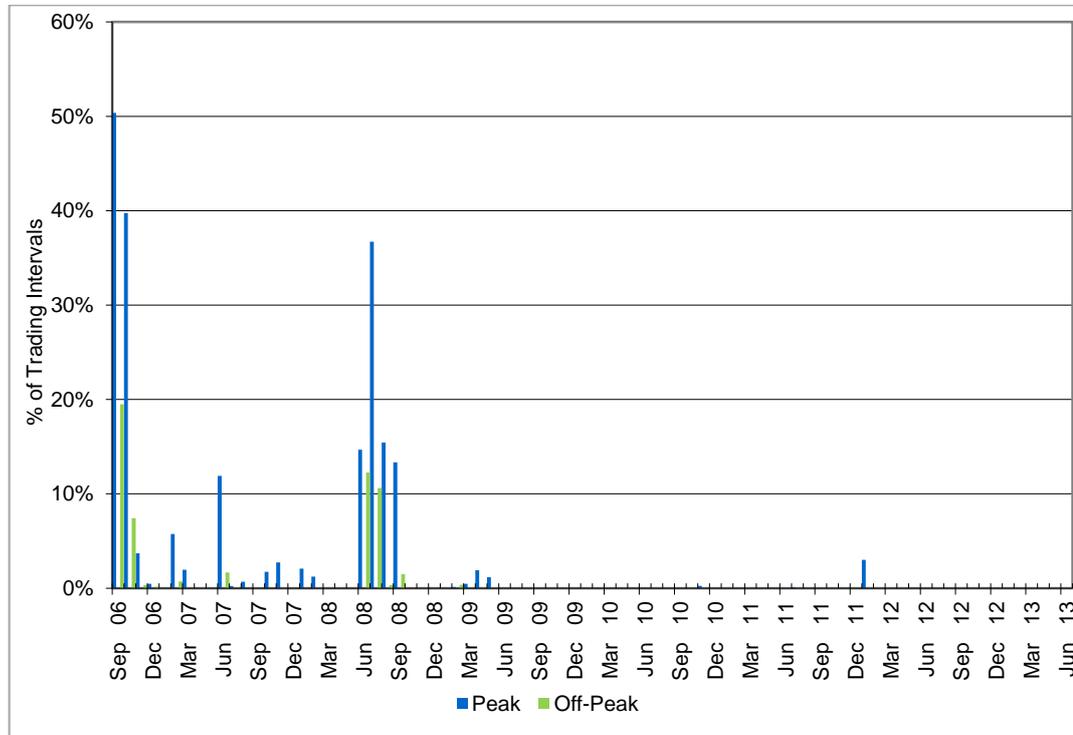
⁴⁴ For example, in the 2008 Energy Price Limits review, the main reason for the decrease in the Alternative Maximum STEM Price was a correction to the way in which the fixed and fuel components of the liquid fuel cost formula were calculated. This correction had the effect of offsetting any increase in the world prices for distillate fuels. In the 2010 Energy Price Limits review, the IMO decided to revise the Risk Margin for calculating the Alternative Maximum STEM Price from 90 percent to 80 percent. In the 2012 Energy Price Limits review, the most significant influence on the Alternative Maximum STEM Price was the increase due to the introduction of carbon pricing in July 2012. A decrease in the Alternative Maximum STEM Price in the 2013 Energy Price Limits review was related to the commencement of operation of the new high efficiency gas turbines at Kwinana in September 2012 which caused a reduced maintenance requirement on the Pinjar machines (determined by the IMO as the highest cost generating works in the SWIS⁴⁴). The Pinjar machines are dual fuel facilities.

⁴⁵ Peak Trading Interval is a Trading Interval occurring between 8am and 10pm; and Off-Peak Trading Interval is a Trading Interval occurring between 10pm and 8am.

⁴⁶ The incident was caused by the rupture of a corroded pipeline and subsequent explosion at a processing plant on Varanus Island on 3 June 2008. The plant, operated by Apache Energy, which normally supplied a

Clearing Prices also reached the Maximum STEM Price during three Peak Trading Intervals between March and May 2009, twice on 3 November 2010, once on 6 July 2011, during 26 peak Trading Intervals in January 2012, during eight Trading Intervals on 25 January 2012, during eleven on 26 January 2012, and during seven on 28 January 2012.

Figure 6 The proportion of Peak and Off-Peak Trading Intervals with STEM Clearing Prices equal to the Maximum STEM Price (per calendar month)



104. Since market commencement, STEM Clearing Prices have only reached the Alternative Maximum STEM Price during Peak Trading Intervals in September 2006 and June 2007. During September 2006 the STEM Clearing Price was at the Alternative Maximum STEM Price for 3.2 per cent of the time. For June 2007, the STEM Clearing Price was at the Alternative STEM price for 0.1 per cent of the time. STEM Clearing Prices have not reached the Alternative Maximum STEM Price during any other period. The Authority understands from the IMO that the high proportion of STEM Clearing Prices reaching the Alternative Maximum STEM Price at the start of the WEM was mainly due to Market Participants being unfamiliar with the market.

3.3.4 Proportion of STEM Bids and Offers with prices equal to the Energy Price Limits

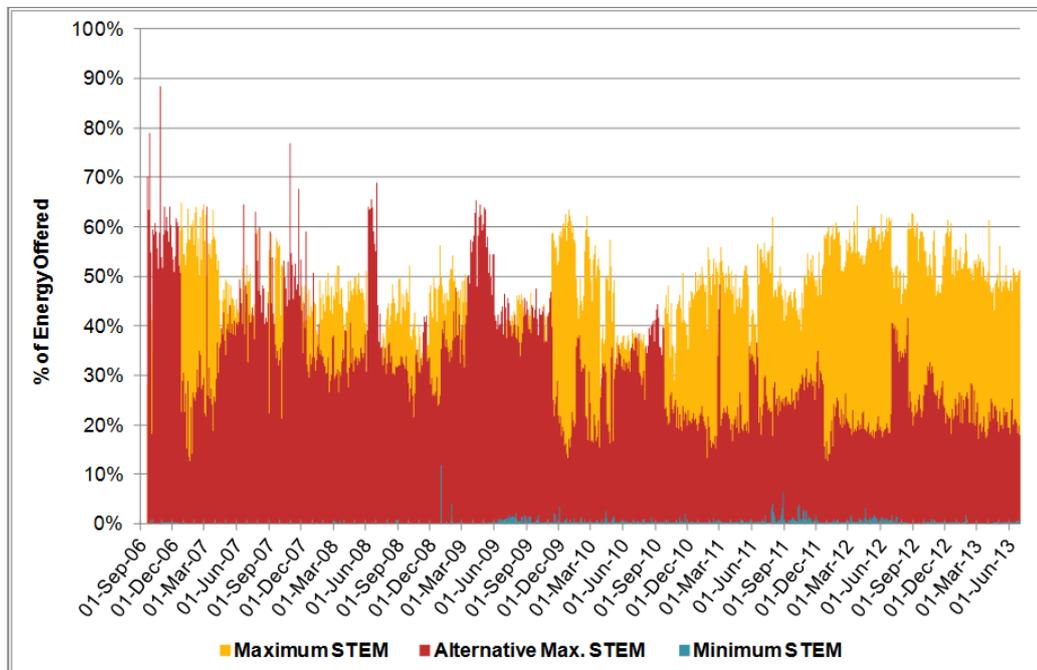
105. Clause 2.26.3 of the Market Rules provides that the Authority's review must examine historical STEM Bids and STEM Offers and the proportion of STEM Bids and Offers with prices equal to the EPLs. These STEM Bids and Offers are made

third of the State's gas, was shut down for almost two months while a detailed engineering investigation and major repairs were carried out. Gas supply from the plant partially resumed in late August. By mid-October, gas production was running at two-thirds of normal capacity, with 85 per cent of full output restored by December 2008.

by all Market Participants, including both Market Generators and Market Customers. Since market commencement, there were many instances where STEM Offers were equal to the Energy Price Limits, specifically, the Maximum STEM Price and Alternative Maximum STEM Price.

106. From market commencement to 30 June 2013, on average, approximately 45 per cent of the quantity of energy offered in STEM was with prices equal to the Maximum STEM Price per Trading Day; approximately 28 per cent of the quantity of energy offered in STEM was with prices equal to the Alternative Maximum STEM Price per Trading Day;⁴⁷ and approximately 0.2 per cent of the quantity of energy offered in STEM was with prices equal to the Minimum STEM Price per Trading Day.
107. Figure 7 shows the proportion of STEM Offers with prices equal to the EPLs per Trading Day, from market commencement to 30 June 2013.

Figure 7 The proportion of STEM Offers with prices equal to the Energy Price Limits per Trading Day



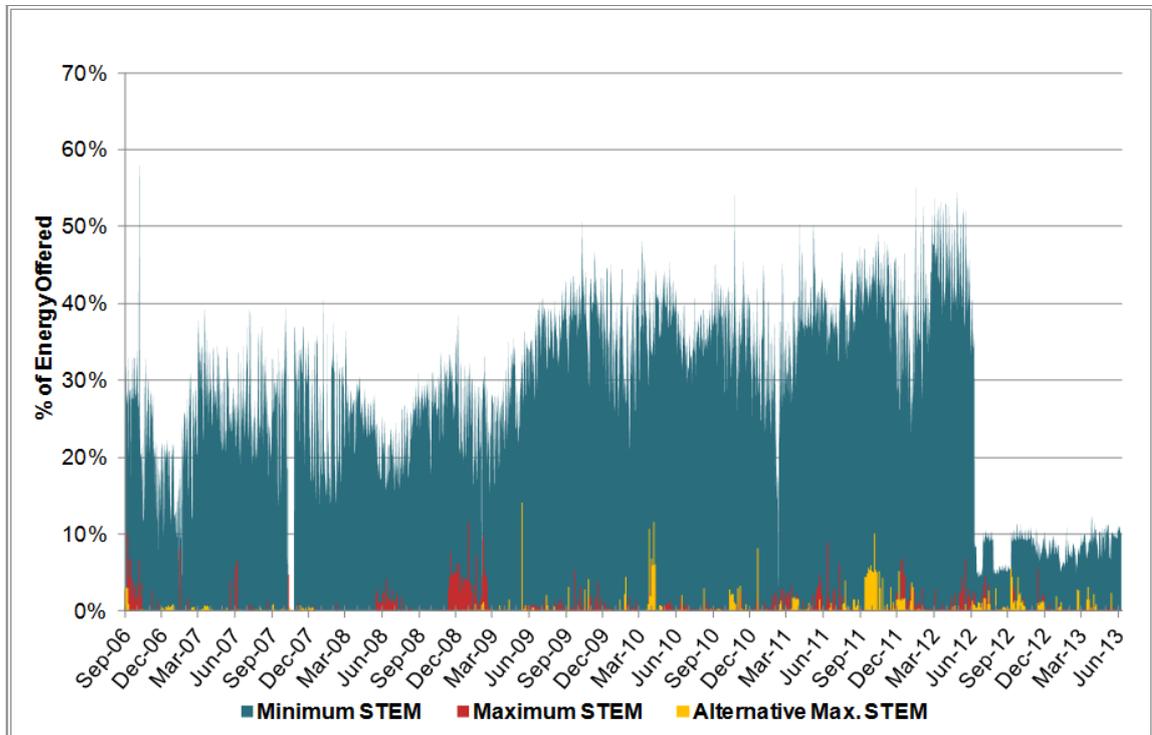
108. Since market commencement, there have been several instances where STEM bids were equal to the Energy Price Limits. From market commencement to 30 June 2013, on average, less than one per cent of the quantity of energy bid in the STEM was with prices equal to the Maximum STEM Price per Trading Day. There was a similar result for the quantity of energy bid with prices equal to the Alternative Maximum STEM Price per Trading Day. Approximately 28 per cent of the quantity of energy bid in the STEM was with prices equal to the Minimum STEM Price per Trading Day.⁴⁸

⁴⁷ These proportions exclude STEM Offers from Synergy as this reflects their bilateral obligations.

⁴⁸ These proportions exclude STEM Offers from Synergy as the majority of Synergy's STEM Offers are at the Alternative Maximum STEM Price. This is due to Synergy requiring the energy to fulfil its bilateral obligations. Further analysis of the proportion of STEM Bids and Offers with prices being equal to the EPLs will be provided in the Authority's Final Report on the review of methodology for setting the MRCP and the EPLs in the WEM.

109. Figure 8 below shows the proportion of STEM Bids with prices equal to the EPLs per Trading Day, from market commencement to 30 June 2013.

Figure 8 The proportion of STEM Bids with prices equal to the Energy Price Limits per Trading Day



3.4 The performance of STEM Auctions and Balancing in meeting the Wholesale Market Objectives

110. Clause 2.16.3 (c) of the Market Rules requires that the Authority's review of the effectiveness of the methodology for setting the EPLs includes an examination of the performance of the STEM Auctions and Balancing in meeting the Wholesale Market Objectives. This section fulfils this requirement.
111. The Authority considers that the clearing prices in the STEM have generally reflected the balance of supply and demand and, in doing so, have provided useful price signals to Market Participants. The Authority also notes the active trading activities in the STEM and the upward trend in the quantity traded since market commencement.⁴⁹
112. However, the Authority is of the view that the STEM has certain limitations. In its 2012 WEM report to the Minister, the Authority highlighted two specific issues in relation to the operation of the STEM. Firstly, the time for gate-closure of submissions in the STEM auction is up to 44 hours in advance and no re-bidding

⁴⁹ Economic Regulation Authority, Discussion Paper: 2013 Wholesale Electricity Market Report to the Minister for Energy, 2013, pp. 16-17. <http://www.erawa.com.au/cproot/11572/2/20130902%20D106646%20-%20Discussion%20Paper-%202013%20Wholesale%20Electricity%20Market%20Report%20to%20the%20Minister%20for%20Energy.pdf>

into the STEM auction is allowed. This arrangement can be too restrictive considering the dynamic nature of changes in electricity supply and demand conditions. Secondly, the STEM Clearing Prices may not reflect the system marginal price in that the STEM does not capture the total forecast system supply as certain generation capacity is not accounted for in the STEM. This is because Intermittent Generator participation in the STEM is optional. Their absence effectively under-states supply and thus could result in higher clearing prices. While forecasting wind generation will be a challenge, particularly with the up to 44 hours STEM cycle, the impact may become more significant as more wind generation capacity is being added to the system.

113. Despite its limitations, the Authority considers the STEM continues to provide a useful platform for bilaterally contracted parties to adjust their positions closer to real time, and the STEM auctions have effectively fulfilled the Wholesale Market Objectives.
114. At the commencement of the WEM, the operation of the Balancing mechanism required that Verve Energy, as the default balancer, maintained a large enough generation portfolio to provide Balancing services. The Authority is of the view that while this mechanism provided a simplified market design, it also introduced various constraints to the market in achieving more efficient operational outcomes. This is because other generators were locked into their Resource Plans one day in advance and there were no opportunities for making changes even when plant conditions assumed at the time of making STEM Submissions were no longer true. This had significant commercial implications for these generators.
115. The competitive Balancing Market introduced in July 2012 addresses these limitations. Under the new regime, most generation facilities connected to the system are required to register as Balancing Facilities⁵⁰ and are obliged to make Balancing Submissions, whereby changes can be made two hours prior to the Trading Interval commencing. The Authority considers that this new market provides greater transparency, which may encourage Market Generators to be more vigilant in assessing their circumstances. The ability for Market Generators to trade energy close to real time also promotes greater opportunities for competition amongst generators and recovery of costs by generators with more cost reflective pricing.
116. In November 2012, Sapere Research Group (**Sapere**) provided the IMO with an assessment of the actual benefits achieved during the first four months of trading under the new Balancing Market. The report concluded that benefits of \$5.1 million had been achieved in the first four months, and that over a twelve month period these would amount to \$15.3 million.⁵¹ Sapere's report states that the introduction of the Balancing Market has increased levels of confidence in the market; improved incentives for investment; and has lowered costs through easing the wider transitional burden towards a well-functioning market.
117. The Authority's assessment of the effectiveness of the new Balancing Market will be included in the Authority's 2013 WEM report to the Minister later this year.

⁵⁰ All Scheduled Generators and Non-Scheduled Generators are required to participate in the Balancing Market, although there are some restrictions on the submissions of Balancing Facilities that do not meet the Balancing Facility Requirements. Refer to clause 7A.1.11 of the Market Rules.

⁵¹ IMO website, Sapere Research Group, Introducing Competition to Balancing Services, a high level cost-benefit analysis, April 2011, http://www.imowa.com.au/f3849,1210362/Combined_MAC_Meeting_37_Papers.pdf

3.5 The effectiveness of the methodology in curbing the use of market power

118. Clause 2.16.3 (c) of the Market Rules requires that the Authority review the effectiveness of the methodology for setting the EPLs in curbing the use of the market power. This section fulfils this requirement.
119. The Authority has noted that there were several instances where energy offers in the STEM were equal to the EPLs (shown in Figure 7), since market commencement. Whilst this may indicate that some generators may have offered energy into the STEM at prices that were above their SRMC in some instances, there is not sufficient evidence that such behaviour relates to market power. Hence, no formal investigation has been carried out by the Authority to date.
120. In light of the relatively higher percentage of offers with prices equal to the Maximum STEM Price, the Authority considers it is likely that these offers would have been priced at a higher price if there had been no such restriction. Hence, the Authority is of the view that the Maximum STEM Price has played a role in providing a line of defence for the prevention of unnecessary higher prices in the market.
121. The Authority has examined the outcome of the STEM auctions. Since market commencement, there were some instances of STEM Clearing Prices reaching the Maximum STEM Price at the beginning of the market, during the Varanus Island incident, and also in some Peak Trading Intervals in the years that followed (shown in Figure 5). Since market commencement, STEM Clearing Prices have only reached the Alternative Maximum STEM Price during Peak Trading Intervals at the start of the WEM, possibly due to Market Participants being unfamiliar with the market.
122. The Authority is of the view that, based on the evidence observed in the market so far, the EPLs have not been set too low or too restrictive. This is evident by the fact that there have not been many instances where the STEM Clearing Prices have reached the EPLs. The Authority believes the EPLs have covered most possible scenarios in the STEM and the methodology in setting the EPLs has been largely effective in curbing market power.
123. The Authority is aware of the view expressed by some stakeholders that only one price cap is needed in the WEM. In its submission to the Authority, Alinta Energy suggests that only one maximum energy price cap (i.e. based on the cost of diesel) should be implemented.
124. Whilst the Authority considers that in a competitive market, a single energy price cap (based on distillate fuel) alone would serve to mitigate the misuse of market power, the Authority considers the removal of the Maximum STEM Price will require some further examination as to the appropriateness of having a single cap and the potential impact on the effectiveness of the market, given the current stage of market development. The Authority is mindful of a number of reviews that are currently being undertaken in relation to the design of the WEM and the implementation of the merger between Verve Energy and Synergy. This may result in some significant changes and implications for competition and market power in the WEM. Hence the Authority considers it is appropriate to retain the current arrangements of two price caps for the time being.

3.6 The appropriateness of the parameters and methodology for recalculating the EPLs

125. Clause 2.16.3 (g) of the Market Rules requires that the Authority's review of the methodology for setting the EPLs should include an examination of the appropriateness of the parameters and methodology in clause 6.20 for recalculating the EPLs. This section fulfils this requirement.
126. As previously explained, the principles for setting the price caps for the energy market in the WEM are clearly stated in the Market Rules under clause 6.20, that is, they are based on the estimate of the SRMC of the most expensive existing generation plant in the SWIS. The Authority considers that these principles are appropriate for the purpose of market power mitigation.
127. The methodology specified in the Market Rules for calculating the price caps relates to the costs of a 40 MW generator that represents the "highest cost generating works in the SWIS". Whilst the specification of a 40 MW generator may be appropriate at market commencement,⁵² the Authority considers it can be too restrictive given the various sizes of units connecting to the SWIS in recent years.⁵³
128. The Authority considers it is appropriate that the Market Rules be amended to state only the underlying principles of the methodology for setting the price caps for the purpose of market power mitigation. The methodology for implementing these underlying principles should be included in a Market Procedure, similar to the Market Procedure for the MRCP. Whether the setting of the price caps should be based on a 40 MW Open Cycle Gas Turbine (**OCGT**) should be a matter for the development of this Market Procedure.
129. The key inputs and approach currently used to calculate the EPL's are set out below.

3.6.1.1 Variable O&M Cost

130. The current Market Rules stipulate that variable O&M is the mean variable O&M costs for a 40 MW open cycle gas turbine generating station and includes, but not limited to, start-up related costs.
131. The determination of Variable O&M costs for the reference unit is based on engineering data. These costs are dependent on the duration for which the machine is operational and how heavily loaded the machine is while it is being dispatched. SKM uses the concept of the dispatch cycle to determine these items, and determines the characteristics of dispatch cycles experienced by the reference machine through the analysis of historic dispatch data obtained from the IMO.

3.6.1.2 Heat Rate

132. The current Market Rules state that the Heat Rate should be determined as the "mean heat rate at minimum capacity".
133. To identify the appropriate minimum capacity reference, SKM has been reviewing historic machine operation to determine an appropriate minimum load for the

⁵² In 2007, the EPLs Working Group examined what generator size would be appropriate as a base for calculating the EPLs, and decided to continue using the 40 MW generator as the reference unit.

⁵³ For example, Perth Energy's three units of 30 MW each in Kwinana.

reference units. SKM has been using a minimum load of 33 per cent of rated capacity and heat rates derived based on a linear approximation across the total operating range of the reference units. The heat rate from the manufacturer's data for that loading level, as well as the sensitivity of the average heat rate to the variation in output, is extracted for modelling the uncertainty in the minimum capacity level.

3.6.1.3 Fuel Cost

134. The current Market Rules require the use of the "mean unit fixed and variable fuel cost" for the calculation of the Maximum STEM Price.
135. The IMO has engaged consultants, ACIL Tasman, to assist it in undertaking a review of gas prices in the WEM. This included updating information on the likely gas prices faced by gas generators in the WEM to be used in the EPLs review; and determining the associated gas price range, gas transport cost and load factor to be included in the calculation of the Maximum STEM Price.
136. SKM's modelling of gas costs is based on recommendations from ACIL Tasman in its gas reviews. SKM uses a tri-lognormal distribution of spot gas prices over a pre defined range, and the upper bound of the distribution is defined by the gas cost that would give the same dispatch cycle cost as if distillate were used. SKM uses a modelled distribution of likely gas prices to determine the Maximum STEM Price. In addition, SKM models the carbon emission cost within the fuel cost component. SKM also uses a modelled distribution of likely gas transport prices to determine the Maximum STEM Price, and bases its determination on recommendations from ACIL Tasman.

3.6.1.4 Loss Factor

137. The current Market Rules stipulate that the loss factor of the reference machine is to be taken into account when calculating the EPLs. The loss factor is the marginal loss factor for a 40 MW OCGT generating station relative to the Reference Node.
138. SKM uses the loss factor extracted from the published loss factors for the reference units by Western Power.

3.6.1.5 Risk Margin

139. The current Market Rules stipulate that Risk Margin is a measure of uncertainty in the assessment of the mean short run average cost for a 40 MW OCGT generating station.
140. SKM calculates the Risk Margin as the percentage difference between the cost outcome that covers 80 per cent of possible outcomes and the cost derived from the mean values of the Variable O&M, Heat Rate and Fuel Cost. Hence, the Risk Margin calculated by SKM is an output of the calculation rather than an input in determining the EPLs.
141. Apart from the matters noted above, the Authority considers the key inputs for the calculation of the EPLs as provided under the Market Rules in clause 6.20.7 are reasonable and the approach that has been utilised thus far by SKM in determining the key inputs for the calculation of the EPLs is appropriate.

Recommendation 3

Section 3.6

The Market Rules should be amended to reflect the principle that the determination of the EPLs and the relevant input components making up the EPLs be based on the highest cost generation plant that exists in the SWIS, without restricting this to a 40 MW OCGT generating plant.

3.7 Other matters

3.7.1 Development of a Market Procedure for the EPLs

142. There is currently no requirement under the Market Rules to develop a Market Procedure for documenting the methodology the IMO is to use and the process to follow in calculating the EPLs.
143. Verve Energy considers that there is value in the IMO developing a Market Procedure for documenting the methodology it uses and the process it follows in calculating the EPLs under the Market Rules. Alinta Energy is also in support of this view.
144. Alinta Energy is of the view that developing a Market Procedure will provide greater transparency of the overall methodology and ensure that any changes to the calculations are subject to a consultation process. It will also ensure the same methodology applied to calculate the Maximum STEM Price is used in every review.
145. The Authority agrees with Verve Energy and Alinta Energy's comments and recommends that the Market Rules be amended to require the development of a Market Procedure by the IMO to transparently describe the methodology to be used and the process to be followed for the EPLs review.
146. The Authority recommends that the EPLs Market Procedure transparently describes the methodology to be used in calculating each of the component costs that comprise the EPLs, i.e. Variable O&M, Heat Rate and Fuel Cost, Loss Factor and Risk Margin. This will eliminate the issue of the Risk Margin being an output rather than an input to the calculation of the EPLs.
147. The Authority is of the view that there is an inconsistency in clauses 6.20.7(a) and 6.20.7(b) of the Market Rules. Clause 6.20.7(a) of the Market Rules refer to the Maximum STEM Price and Alternative Maximum STEM Price being based on the IMO's estimate of the **short run marginal cost** of the highest cost generating works in the SWIS fuelled by natural gas and distillate, respectively. In contrast, clause 6.20.7(b) refers to the Risk Margin used to calculate the Maximum STEM Price and Alternative Maximum STEM Price being a measure of uncertainty in the assessment of the **mean short run average cost** for a 40 MW open cycle gas turbine generating station. This is a matter that should be addressed by the IMO as part of the development of the Market Procedure for the EPLs.
148. The Authority considers that as part of the IMO's development of the EPLs Market Procedure, the IMO should consider amending the Market Rules to require that at

least once in every five year period, the IMO must review the Market Procedure for setting the EPLs and must undertake a public consultation process in respect of the outcome of the review.

149. In the 2011 Energy Price Limits review, Synergy raised a concern that the IMO's consultant did not create inputs required under the Market Rules to calculate the component parts that deliver the Energy Price Limits, and that the cost component values represent outputs of the process rather than inputs. The Authority believes it would be beneficial that the Market Rules be amended to more transparently describe the accepted probabilistic methodology for the review through an EPLs Market Procedure.
150. Verve Energy considers that the current EPLs annual review process seems to impose high overhead costs which can potentially be costly to the market. Verve Energy suggests that streamlining potentially superfluous and time consuming processes and reducing the frequency of the EPLs review would be beneficial to the market. Verve Energy considers that the Authority should undertake a cost benefit exercise to assess the current annual review process against the following suggested process, that is, undertaking a thorough first principles review every three or five years; applying appropriate escalators in the out-years; and including the ability to undertake an "out of cycle" review should there be any significant changes or circumstances warranting such a review.
151. Alinta Energy is of the view that the frequency of reviewing the EPLs should be reduced to three yearly subject to regular CPI adjustments to promote greater allocative efficiency, and that the IMO should be able to propose and consult on revisions to the EPLs outside of the normal review cycle.
152. The Authority considers reducing the frequency of the EPLs review and streamlining the review process will serve to promote greater efficiency to the market. The Authority considers that as part of the IMO's development of the EPLs Market Procedure, the IMO should consider conducting a thorough EPLs review every three years with appropriate escalators being applied to the components making up the EPLs between reviews. It should also consider amending the Market Rules so that the IMO has the ability to conduct a thorough review and consultation process at any time should there be any significant changes in the market that would warrant such a review.
153. The Authority recommends these changes to the Market Rules be made through a standard Rule Change process to be initiated by the IMO.

3.7.2 *Lack of powers for the IMO to obtain actual operational data*

154. Under the Market Rules, the IMO does not have power to obtain confidential operational data from Market Participants for the EPLs reviews, and the IMO is required to use input assumptions for its modelling of Fuel Costs, Heat Rates and Variable O&M costs in calculating the EPLs.
155. Alinta Energy and Verve Energy consider that the Market Rules should not be amended to extend powers to the IMO and the Authority to request operational data from Market Participants for the purposes of the calculation of the energy price caps. Verve Energy is concerned with the risk that this information could be used for other purposes, and that a large proportion of the data that the Authority would be requesting is commercial in confidence. Verve Energy is also concerned that it

would not be able to provide such information without being in breach of various contracts.

156. The Authority is of the view that extending the IMO's powers to request actual operational data from Market Participants will provide more accurate input to the modelling process and greatly enhance the overall review of the EPLs. The Authority appreciates that the data obtained should only be used for the purpose of the EPLs review process without compromising the confidentiality of the information.
157. The Authority considers that it is appropriate to amend the Market Rules to extend the IMO's powers to obtain actual operational data from Market Participants for the purpose of calculating the EPLs, and that this matter should be reviewed as part of the development of the EPLs Market Procedure.

3.7.3 Issues relating to the Alternative Maximum STEM Price

Approval by the Authority

158. The Market Rules are unclear on whether a single value or the price components of the Alternative Maximum STEM Price is to be approved by the Authority.
159. The Authority is of the view that it is more appropriate to approve the price components for the Alternative Maximum STEM Price rather than a single value. This is because the Alternative Maximum STEM Price is revised every month according to changes in the distillate price as provided in clause 6.20.3(b) of the Market Rules.
160. The Authority considers that it is appropriate to amend the Market Rules so that the Authority approves the price components for the Alternative Maximum STEM Price rather than a single value, and that this matter should be reviewed as part of the development of the EPLs Market Procedure.

Use of the Singapore Gas Oil (0.5% sulphur) price

161. The Market Rules refers to the use of the Singapore Gas Oil (0.5% sulphur) price in the calculation of the Alternative Maximum STEM Price.
162. The Authority is aware of the view expressed by the IMO that the Alternative Maximum STEM Price should be based on the use of the Singapore Oil 10 ppm price, on the basis that this price is more relevant to distillate used for power generation in Western Australia than the Singapore Gas Oil (0.5% sulphur) price.
163. The Authority considers that it is appropriate for this matter to be reviewed as part of the development of the EPLs Market Procedure.

Adjustment rules for recalculation

164. The CPI adjustment rules for the calculation of the Alternative Maximum STEM Price in clause 6.20.3 is based on the assumption that each annual review would provide updated values that apply from 1 September. Since the 2012 EPLs review, the IMO has been proposing new values to take effect from 1 July, to reflect the impact of carbon pricing as part of the Clean Energy Scheme, which commenced on 1 July 2012. The Authority is of the view that there appears to be a misalignment in the timing of the adjustment rules for the calculation of the Alternative Maximum STEM Price.

165. Alinta Energy is of the view that the Market Rules should be amended to re-align the timing of the adjustment rules for the calculation of the Alternative Maximum STEM Price.
166. The Authority considers that it is appropriate for the timing of the adjustment rules for the calculation of the Alternative Maximum STEM Price to be reviewed as part of the development of the EPLs Market Procedure.

Recommendation 4

Section 3.7

The Market Rules should be amended to require the IMO to develop a Market Procedure that transparently describes the methodology to be used and the process to be followed for the EPLs review.

As part of this Market Procedure development, consideration should be given to: whether a thorough EPLs review should be conducted every three years, with appropriate escalators being applied to the components making up the EPLs between reviews; and the ability for the IMO to conduct a thorough review, at any time, should there be any significant changes in the market.

3.8 Conclusion

167. As discussed in the previous chapter, market power and the potential for market power being exercised remains an on-going concern in the WEM. Hence, the Authority considers that regulatory intervention will be necessary going forward until such time that competition in the market evolves further and becomes effective. The Authority considers that the requirement for cost-based bidding in the energy market (i.e. the SRMC rule) and the use of the price caps in the WEM should be continued.
168. Whilst the Authority considers that in a competitive market, a single energy price cap (based on distillate fuel) alone would serve to mitigate the misuse of market power, the Authority considers the removal of the Maximum STEM Price will require some further examination as to the appropriateness of having a single cap and the potential impact on the effectiveness of the market, given the current stage of market development. The Authority is mindful of a number of reviews that are currently being undertaken in relation to the design of the WEM and the implementation of the merger between Verve Energy and Synergy. This may result in some significant changes and implications for competition and market power in the WEM. Hence the Authority considers it is appropriate to retain the current arrangements of two price caps for the time being and re-examine the matter at a later stage.
169. For the purposes of mitigating market power, the Authority is of the view that there is no reason for the inclusion of a Minimum STEM Price in the WEM. The Authority recommends that consideration be given to exploring the costs and benefits of removing the Minimum STEM Price from the WEM.

4 Methodology for setting the Maximum Reserve Capacity Price

170. Clause 2.26.3 of the Market Rules requires that the Authority's review of the methodology for setting the MRCP must examine:

- the appropriateness of the parameters and methodology in clauses 4.16 and the Market Procedure referred to in clause 4.16.3 (i.e. the MRCP Market Procedure) for recalculating the MRCP (clause 2.26.3(f));
- the performance of Reserve Capacity Auction in meeting the Wholesale Market Objectives (clause 2.26.3 (h)); and
- other matters which the Authority considers relevant; among other things (clause 2.26.3(i)).

171. This chapter fulfils these obligations.

4.1 The Role of the Maximum Reserve Capacity Price

172. The establishment of a capacity market provides a platform for buyers and sellers to trade capacity and for the market administrator, responsible for ensuring sufficient capacity is available to the system, to procure capacity competitively.

173. The Reserve Capacity Auction in the design of the WEM is specifically provided as a means for the IMO to procure capacity in an open, transparent and competitive manner to ensure achievement of the Wholesale Market Objectives.

174. For the purpose of curbing the use of market power, regulatory intervention was considered necessary at the start of the market and setting a price cap for the Reserve Capacity Auction, i.e. the MRCP, was essentially a market power mitigation measure.

175. Apart from setting the maximum price for offers into a capacity auction under clause 4.18.2 of the Market Rules, the Authority notes that the MRCP has played another role in the market under the existing Market Rules: Under clause 4.29.1, when the Reserve Capacity Auction is cancelled by the IMO, the MRCP is the reference price for the administrative calculation of the price for capacity, i.e. the RCP, which is set at 85 per cent of the MRCP (with adjustment for any excess capacity).

4.2 Current methodology for setting the MRCP

176. Clause 4.16 of the Market Rules sets out the requirements and process for setting the MRCP. In particular, it requires the IMO to develop a Market Procedure documenting the methodology it uses and the process it follows in determining the MRCP.

177. The MRCP Market Procedure sets out the principles to be applied and the steps to be taken by the IMO in order to develop and propose the MRCP.⁵⁴

⁵⁴ Add reference of the MRCP Market Procedure.

178. The methodology for calculating the MRCP value has gone through a number of changes over the years since market commencement.
179. The methodology for setting the MRCP was initially included in the Market Rules as an appendix (Appendix 4 of the original Market Rules). In 2008, the IMO, in conjunction with an industry based advisory group, undertook an assessment of the methodology and concepts surrounding the determination of the MRCP.⁵⁵ Based on outcomes from this review, the IMO put forward a Rule Change Proposal (RC_2008_11), proposing changes to the relevant sections of the Market Rules in relation to the MRCP, including the development of the MRCP Market Procedure and the removal of Appendix 4 from the Market Rules.⁵⁶ A new clause (clause 4.16.9) was also included, as part of the proposed changes, that requires the IMO, at least once in every five year period, to review the MRCP Market Procedure. This Rule Change Proposal was finalised and approved by the IMO in July 2008.
180. Subsequently, the MRCP Market Procedure was developed which took effect on 13 October 2008. In 2010, the IMO brought forward its 5-yearly review of the MRCP Market Procedure and established a working group to consider, assess and develop any necessary change to the Market Procedure. This review was completed in June 2011. Based on outcomes from this review, the IMO submitted a Procedure Change Proposal (PC_2011_06) in September 2011, proposing some significant changes to the MRCP Market Procedure. This Procedure Change Proposal was approved by the IMO and the amended Market Procedure commenced on 24 October 2011.
181. A brief summary of the changes made to the MRCP Market Procedure is provided in Appendix 3.
182. The current methodology for calculating the MRCP, as specified in the Market Procedure, includes a technical costing of the following components:
- the capital cost of an industry standard, liquid-fuelled OCGT with a nominal nameplate capacity of 160 MW with an inlet cooling system, located within the SWIS;
 - the land cost associated with developing and constructing the power station;
 - the costs associated with the development of liquid fuel storage and handling facilities;
 - the costs associated with the connection of the power station to the bulk transmission system;
 - the fixed operating and maintenance (**O&M**) costs for the power station, fuel handling facilities and the transmission connection components;
 - a margin for legal, insurance, financing and environmental approval costs plus contingencies; and
 - the Weighted Average Cost of Capital (**WACC**).

⁵⁵ Through this review process, the Advisory Group found that the existing Market Rules to determine and review the MRCP could be improved to allow the MRCP to be determined in a cost-reflective and transparent manner so that minor changes to the methodology can be implemented without the need for Market Rule changes

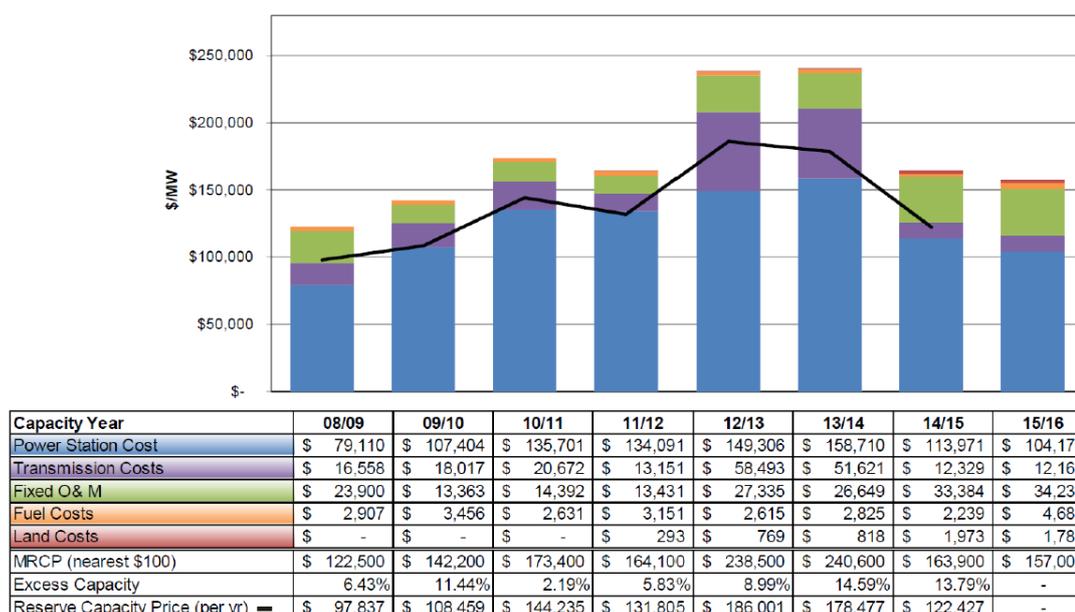
⁵⁶ Refer to the IMO Final Rule Change Report RC_2008_11: Maximum Reserve Capacity Price. http://www.imowa.com.au/f299.11647/RC_2008_11_20080708_Final_RuleChangeReport.pdf

183. The Market Procedure also sets details as to how each of these cost components should be estimated, sources of information and the formulas to be applied.

4.2.1 History of the Maximum Reserve Capacity Price

184. The Market Rules set an initial MRCP value of \$150,000 per MW per year for the period from market commencement (21 September 2006) through to 1 October 2008. From Capacity Year 2008/09 onwards, the values for the MRCP have been determined in accordance with the methodology defined in the Market Rules and the Market Procedure. Figure 9 below illustrates the values for the MRCP values from 2008/09 to 2015/16 Capacity Years.

Figure 9 Movement of the MRCP values for 2008/09 – 2015/16 Capacity Years



Source: IMO

185. The MRCP value for the 2008/09 Capacity Year was determined at \$122,500 per MW per year, which represented a reduction of 18 per cent compared to the initial value set in the Market Rules of \$150,000 per MW per year. Since then, there was a steady increase in the MRCP value determined for 2009/10 and 2010/11 Capacity Years, at \$142,200 per MW per year and \$173,400 per MW per year, respectively.
186. The MRCP value for the 2011/12 Capacity Year was determined at \$164,100 per MW per year, following the application of the new MRCP Market Procedure established in October 2008 (which was discussed in paragraph 177 earlier).
187. The MRCP value was set at \$238,500 per MW per year for the 2012/13 Capacity Year, an increase of 45 per cent compared to the value for the 2011/12 Capacity Year. This elevated value was largely driven by the higher transmission cost estimates due to changes in the methodology applied by Western Power to provide an estimate of the transmission connection cost, combined with higher estimates for power station cost and fixed operating and maintenance (i.e. Fixed O&M) cost at the time. The MRCP value for the 2013/14 of \$240,600 per MW per year remained at a similar level to the 2012/13 Capacity Year.

188. Following the application of the amended MRCP Market Procedure resulting from the IMO's five-yearly review of the MRCP Market Procedure (discussed previously in paragraph 178 earlier), the MRCP value was set at \$163,900 per MW per year for 2014/15 Capacity Year. This represented a reduction of 32 per cent from the previous year, which was attributable to a combination of the impact of methodology changes made in the MRCP Market Procedure (i.e. changes to the methodology for estimating the transmission connection cost by Western Power and the inclusion of the inlet cooling in the reference power station) and the impact of year-on-year variations in input parameters, in particular, the lower value estimated for the WACC.⁵⁷
189. The MRCP value for the 2015/16 Capacity Year was determined at \$157,000 per MW per year which represented a relatively small reduction from the previous year.⁵⁸
190. The Authority notes that the volatility of the MRCP values has been a concern raised by some market participants. This is particularly of concern because the price for capacity (i.e. the RCP) has been calculated with reference to the MRCP. The volatility in the MRCP value and the subsequent flow-on to the RCP value has been seen as a material risk factor of investing in capacity in the WEM.
191. In its submission to the Authority's Consultation Paper, Alinta Energy has noted that the Authority should investigate options for creating greater capacity price stability, which is vital for encouraging investment in the WEM. Alinta Energy suggests that options for providing greater price stability and potential options to lock in a capacity price outside of the current auction mechanism should be explored by the Authority. Alternatively, an investigation of any options to enhance capacity price stability should be incorporated into the scope of works for any broader review of the WEM.
192. Perth Energy's submission also notes the volatility in the MRCP since the commencement of the WEM. It is of the view that there is an issue of the MRCP being used for two purposes: firstly, as a signal to investors regarding the building of new capacity; and secondly, to set the price for Capacity Credits for existing generators. With regards the first purpose, Perth Energy considers that the MRCP should exhibit some variability to reflect changing capacity requirements and so send the appropriate price signals to encourage or deter additional capacity expansion. However, this volatility is being carried through to payments for existing capacity the development of which was prompted by a previous MRCP. Perth Energy considers that the volatility of the MRCP would be less problematic if the two purposes could be separated in some way.
193. The Authority considers that the link between the MRCP and RCP, as it currently stands, needs to be broken. As mentioned earlier, the primary role of MRCP is that it provides a price cap in the capacity auction to help mitigate market power. Such a price cap is not intended to be used as a benchmark for determining the price for capacity. The MRCP should not be used for sending investment signals to investors for building new capacity or pricing capacity payments for existing generators.

⁵⁷ For more detail, refer to IMO (2012), Final Report: Maximum Reserve Capacity price for the 2014/15 Capacity Year
http://imowa.com.au/f175,3224148/IMO_Final_Report_Max_Reserve_Capacity_Price_2014_15.pdf

⁵⁸ The reduction was largely due to a reduced bond yield which was partially off-set by the change in the gamma value (from 0.5 to 0.25) following the application of the IMO's Procedure Change Proposal to change the gamma value in January 2013.

194. The methodology for deriving RCP, and its role within the overall RCM, is an issue that was highlighted in the Authority's 2012 Wholesale Electricity Market Report for the Minister for Energy. The Authority noted that: *"Given the significance of the issue, the Authority recommends that the PUO undertake a comprehensive, holistic review of the current market design of the RCM in its entirety, with a view to considering the long term evolution of the market and the realisation of efficient economic outcomes."*
195. The Authority is aware of the work undertaken by the Reserve Capacity Mechanism Working Group (**RCMWG**), chaired by the IMO, and the proposed changes to the formula for calculating the RCP in setting the administered price for capacity.⁵⁹ The Authority understands the proposed changes will be put through the IMO's formal Rule Change Process which includes public consultation.

Recommendation 5

Section 4.2

The linkage between the MRCP and the RCP, as it currently stands, should be broken. An alternative method for setting the RCP when no market price for capacity is available due to a capacity auction not being held, should be explored by the IMO.

4.3 Historical Reserve Capacity Offers, the proportion of Reserve Capacity Offers with prices equal to the MRCP and the performance of Reserve Capacity Auctions in meeting the Wholesale Market Objectives

196. Clause 2.26.3 (d) requires that the Authority's review of the methodology for setting the MRCP include an examination of historical Reserve Capacity Offers and the proportion of Reserve Capacity Offers with prices equal to the MRCP.
197. Clause 2.26.3 (h) requires that the Authority's review of the methodology for setting the MRCP include an examination of the performance of the Reserve Capacity Auction in meeting the Wholesale Market Objectives.
198. As discussed previously, the Reserve Capacity Auction has not been held in the WEM since its inception. This is because there has been always sufficient capacity made available through the Bilateral Declaration process to meet the system capacity requirement (i.e. the RCR) without an auction being held by the IMO. As a result, there have been no Reserve Capacity Offers observed so far.
199. Consequently, there is nothing for the Authority to comment on in relation to clause 2.26.3(d) and clause 2.26.3(h) of the Market Rules.

⁵⁹ For more detail, refer to http://www.imowa.com.au/f5415.3566068/Combined_RCMWG_Mtg_10_Papers.pdf

200. The Authority notes Merredin Energy's view expressed in its submission to the Authority's Consultation Paper that the Reserve Capacity Auction be disbanded and that the market should move to an administered reserve capacity price only. Merredin Energy has noted that to be able to participate in an auction, a project must have secured certification which, in turn, requires it to have secured a network access offer, arranged finance, secured a site, secured firm plant supply offers and advanced environmental approvals. It is of the view that a proponent would unlikely take a significant project to this stage of development unless it intended to secure capacity credits through a bilateral trade arrangement. In the event that an auction were to take place, Merredin Energy is concerned that there is a significant risk that it could be gamed by a proponent to push prices to the maximum permitted level or that the price could collapse due to a project bidding at zero, or close to zero.
201. The Authority considers that these matters raised by Merredin Energy should be considered as part of the review of the RCM as recommended by the Authority.

4.4 The effectiveness of the methodology in curbing the use of market power

202. Clause 2.26.3 (c) requires that the Authority's review of the methodology for setting the MRCP include an examination of the effectiveness of the methodology in curbing the use of the market power.
203. For the same reason discussed in section 4.2, i.e. no Reserve Capacity Offers have been observed due to a Reserve Capacity Auction having not been held in the WEM to date. Consequently, the Authority is not in a position to comment on the effectiveness of the current MRCP methodology in curbing the use of the market power based on empirical evidence.
204. However, given the concentrated market structure in the WEM at present, the Authority considers that the potential use of market power when a Reserve Capacity Auction is held remains a valid concern. For this reason, the Authority considers it is appropriate to retain the MRCP as a price cap for capacity offers into the Reserve Capacity Auction as a protection to consumers.
205. In light of the amount of excess capacity that currently exists in the WEM, the Authority understands that there is only a small probability that a Reserve Capacity Auction will be held in the near future. Hence, the use of the MRCP for curbing the use of market power in a capacity auction may not be imminent.

4.5 The appropriateness of the parameters and methodology for recalculating the MRCP

206. Clause 2.26.3 (f) requires that the Authority's review of the methodology for setting the MRCP include an examination of the appropriateness of the parameters and methodology in clause 4.16 and the Market Procedure referred to in clause 4.16.3, i.e. the MRCP Market Procedure, for recalculating the MRCP. This section fulfils this requirement.⁶⁰

⁶⁰ Clause 4.16 of the Market Rules sets the requirements and the steps that must be followed by the IMO for proposing a revised value for the MRCP. The methodology and the process for determining the MRCP value is documented in the MRCP Market Procedure.

207. As noted in paragraph 32 earlier, the Authority considers there should be no overlap in the roles of the Authority and the IMO in the review of the methodology for setting the MRCP. Hence the Authority's assessment has focussed on the appropriateness of the key concepts and principles underlying the methodology for setting the MRCP and whether further clarity is required in the Market Rules. These underlying principles should then flow into the review of the MRCP Market Procedures by the IMO. Hence, the Authority's assessment in this area is provided at a high level.
208. The current MRCP Market Procedure defines how the estimate for each of the seven cost components should be derived in calculating the MRCP. These cost components are:
1. costs for the power station development;
 2. land cost associated with developing and constructing the power station;
 3. costs associated with the development of liquid fuel storage and handling facilities;
 4. costs associated with the connection of the power station to the bulk transmission system;
 5. O&M costs for the power station, fuel handling facilities and the transmission connection components;
 6. a margin provision for legal, insurance, financing and environmental approval costs plus contingencies; and
 7. the cost of capital, i.e. WACC .
209. A brief description of these cost components and how they have been estimated is provided below.

Costs for the power station

210. Under the MRCP Market Procedure, the generic power station upon which the MRCP shall be based on is an industry standard, liquid fuelled, 160 MW OCGT power station, which has a capacity factor of two per cent. The power station includes an inlet air cooling system and water receival and storage facilities to allow 14 hours of continuous operation.
211. The MRCP Market Procedure states that the IMO must engage a consultant to provide this cost estimate for the power station development that includes costs associated with engineering, procurement and construction of the power station.
212. Consistent with this requirement, the IMO has engaged a consultant, i.e. Sinclair Knight Merz (**SKM**), to develop the required cost estimate for input into the calculation of the MRCP value. SKM has 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. When delivering its cost estimate to the IMO, SKM provides the IMO a detailed report explaining the basis based on which the cost estimate has been derived.⁶¹

⁶¹ For a recent report prepared by SKM, refer to http://www.imowa.com.au/f175.3224117/WP04558-OSR-RP-0001_Rev_3_2013_IMO_MRCP_Report.pdf

Transmission connection works

213. The MRCP Market Procedure requires Western Power to provide an estimate of the total transmission costs to connect the generator and deliver the output to loads consistent with the relevant planning criteria in the Technical Rules.⁶² This estimate must be derived from capital contributions (either paid historically or expected to be paid to Western Power under Access Offers and Western Power's Contribution Policy as approved by the Authority) only for generators that are capable of being gas or liquid fuelled.⁶³
214. The MRCP Market Procedure sets the methodology and process that Western Power must follow in deriving the estimate of total transmission costs. As the connection costs for individual projects are confidential to Western Power and the project developer, Western Power is required to provide an audit report verifying and confirming that Western Power has met the requirements under step 2.4.1 of the MRCP Market Procedure.⁶⁴
215. The Transmission Connection Cost is calculated by Western Power using actual connection costs and Access Offers that have been determined by Western Power for projects within a five-year window, and weights each connection cost according to the year that the facility commenced, or is expected to commence, operation.
216. In its response to the Authority's Consultation Paper, Perth Energy has noted that a key concern with the existing MRCP methodology was the potential volatility resulting primarily from the method used by Western Power to provide an estimate of deep connection costs as part of overall transmission network access costs. Perth Energy suggests that 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 should be used. Perth Energy views that 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, and that this would remove much of the volatility of the MRCP.
217. The Authority considers this matter should be considered as part of the IMO's review of the Market Procedure.

Fixed O&M costs

218. Fixed O&M costs consist of four key components, i.e. fixed generation O&M costs, fixed transmission connection O&M costs, fixed network access charges and annual insurance costs for a power station asset.⁶⁵
219. The MRCP Market Procedure states that:

⁶² See Western Power website, *Technical Rules web page*, http://www.westernpower.com.au/aboutus/accessArrangement/Technical_Rules.html

⁶³ Refer to step 2.4.1. of the MRCP Market Procedure for further detail, http://www.imowa.com.au/f711,3258850/PC_2012_08_Final_Amended_Market_Procedure_clean_.pdf

⁶⁴ To view the most recent report prepared by Western Power for delivering its estimate of this cost component, refer to http://www.imowa.com.au/f175,3224129/WE_n9834837_v3_2012_MRCP_for_the_2015_16_Capacity_Year_-_Total_Transmission_Cost_Estimate_for_the_Maximum_R.pdf

⁶⁵ The MRCP Market Procedure provides for power station asset replacement, business interruption and public and products liability insurance as required under network access arrangements with Western Power.

- the IMO must determine fixed O&M costs for the power station and the associated transmission connection works;
 - fixed O&M costs must include fixed network access charges and an estimate of annual insurance costs as at 1 October in Year 3 of the Reserve Capacity Cycle; and
 - fixed O&M costs shall be converted into an annualised amount.
220. The MRCP Market Procedure states that the IMO may engage a consultant to assist the IMO in this process. The IMO has engaged SKM in deriving estimates for the cost components relating to the generator assets and the switchyard and transmission line assets. An annuity is calculated taking the first 15 years of these costs. The detailed methods applied by SKM for estimating these cost components are included in SKM's report to the IMO each year.
221. For the fixed network access charges, the IMO derives its estimate based on Western Power's Price List that provides the various charges for network access and related services that apply for generation facilities. As the use of system charge varies by location, the IMO considers the list of locations nominated in the Market Procedure and uses the most expensive of these locations.
222. In deriving its estimate of the insurance costs, the IMO estimates the relevant insurance premiums through consultation with well-known insurance brokers and insurance renewal information provided by Market Participants. This source of information has been provided to the IMO only in confidence and the IMO has not been able to publish this information.
223. The Authority has noted some other cost components that are identified by market participants in their submissions to the Authority. Perth Energy has expressed its view that as part of the calculation of the fixed O&M, it should also include the costs of running the power station for the IMO's verification tests, the Department of Environment and Conservation's emissions tests and the Western Power technical compliance tests. Verve Energy considers 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.
224. The Authority considers these matters should be considered as part of the IMO's review of the Market Procedure.

Fixed fuel cost

225. The MRCP Market Procedure states that the IMO must engage a consultant to determine an estimate of the costs for the liquid fuel storage and handling facilities of the generic power station. The costs should be those associated with a fuel tank of 1,000 tonne capacity, facilities to receive fuel from road tankers and all associated pipe work, pumping and control equipment. The cost should include an allowance for the initial supply of fuel to enable the power station to operate for fourteen hours at maximum capacity.

226. The IMO engaged SKM to provide an estimate of this cost component for calculating the MRCP for the 2015/16 Capacity Year.⁶⁶ SKM has developed its estimate with the benefit of recent project experience in Western Australia.

Land costs

227. The MRCP Market Procedure states that the IMO must retain Landgate under a consultancy agreement to provide valuations on parcels of industrial land in regions within the SWIS where generation projects are most likely to be proposed.⁶⁷
228. The MRCP Market Procedure requires that the IMO provide an indication as to the size of land required, which should be limited to: a three hectare parcel of land in an industrial area of a standard size, with consideration given to any requirements for a buffer zone in that specific location; and the summation of multiple smaller parcels of land as appropriate to meet these requirements. The MRCP Market Procedure identifies six specific sites that will be used for this calculation.⁶⁸
229. For calculating the MRCP for the 2015/16 Capacity Year, Landgate provided its estimate of the cost of each land parcel as at 30 June 2012, excluding stamp duty.⁶⁹ The IMO then added the applicable stamp duty to each land parcel cost, determined by the online calculator provided by the Office of State Revenue.

Legal, financing, approvals, contingencies and other costs (margin M)

230. The MRCP Market Procedure provides an allowance for legal costs, financing costs, insurance costs, approval costs, contingency costs and other costs reasonably incurred in the design and management of the power station construction. This allowance is referred to as margin M.
231. The MRCP Market Procedure states that the IMO must engage a consultant to determine the value of margin M. Consistent with the requirement of this procedure, the IMO engaged SKM to provide an estimate of margin M for each of the Reserve Capacity Cycles over recent years. SKM's approach to estimating the cost components is based on its in-house data and knowledge of comparable developments, excluding any abnormal costs that may be particular to individual projects.

Weighted average cost of capital (WACC)

232. The MRCP Market Procedure states that *“the IMO must determine the cost of capital to be applied to the various costing components of the MRCP. This cost of capital must be an appropriate WACC for the generic Power Station project considered, where that project is assumed to receive Capacity Credits through the Reserve Capacity Auction and be eligible to receive a Long-Term Specific Price Arrangement.”*

⁶⁶ For more detail, refer to http://www.imowa.com.au/f175,3224117/WP04558-OSR-RP-0001_Rev_3_2013_IMO_MRCP_Report.pdf

⁶⁷ To view the most recent report prepared by Landgate, refer to <http://www.imowa.com.au/f175,3224125/Ss21570178912091113540.pdf>

⁶⁸ These regions are: Collie Region, Kemerton Industrial Park Region, Pinjar Region, Kwinana Region, North Country Region and Kalgoorlie Region.

⁶⁹ To view the most recent report provided by Landgate, refer to <http://www.imowa.com.au/f175,3224125/Ss21570178912091113540.pdf>

233. The WACC parameter plays a key role in the annualisation process to convert the capital costs of the generic power station into an annualised capital cost and to account for the cost of capital in the time period when capital is raised and when the payment stream for Capacity Credits is expected to be realised.
234. The method for calculating the pre-tax real Officer WACC required in the MRCP Market Procedure⁷⁰ involves a number of components. These components are classed as which require review annually (known as Annual components) and those which require review every five years (known as five-yearly components). For example, debt risk premium is classed as an Annual component, whilst market risk premium is classed as a five-yearly component.
235. In determining the cost of capital, the IMO often seeks assistance from external consultant on specific WACC components. For example, the IMO sought advice from PricewaterhouseCoopers in relation to debt risk premium estimates and calculated the remaining WACC components itself from publicly available information, in its determination of the WACC for the calculation of the MRCP value for the 2015/16 Capacity Year.⁷¹
236. In its submission to the Authority's Consultation Paper, Merredin Energy has expressed its view that there is too much subjectivity in the determination of the MRCP components. It raised examples including: the period of time used to select the risk free rate being determined by the IMO and is somewhat arbitrary; and some of the WACC parameters being reviewed five yearly unless the IMO considers there to be a market event that causes a review. Merredin considers it is poor public policy for the IMO to be able to make judgement calls on which parameters to review and when, and that best practice would see the IMO publish guidelines on that point or review all parameters annually.
237. The Authority considers this matter should be considered as part of the IMO's review of the Market Procedure.

Formula for calculating the MRCP

238. The formula for calculating the MRCP is defined under step 2.10 of the MRCP Market Procedure as follows:

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

where

ANNUALISED_CAPCOST is the total capital cost, estimated for the generic OCGT power station, annualised over a 15 year period, using the cost of capital, i.e. WACC;

ANNUALISED_FIXED_O&M is the annualised fixed operating and maintenance costs for a typical OCGT power station and any associated electricity transmission facilities; and

CC is the expected Capacity Credit allocation for the generic OCGT power station.

⁷⁰ Clause 2.9.6(c) of the MRCP Market Procedure.

⁷¹ Refer to IMO website: <http://www.imowa.com.au/mrcp>

The Authority's view

239. The above formula and the estimation methods of the input parameters described in the MRCP Market Procedure eventually delivers a point estimate for the MRCP value.⁷² Based on the Authority's understanding of this methodology, the Authority is of the view that the resulting MRCP value is more representative of the expected average value rather than the expected maximum value of the associated cost required for establishing the reference peaking power plant (i.e. 160 MW OCGT plant) in the SWIS.
240. As noted previously, setting a price cap at an appropriate level requires balance between different objectives. If the price cap is set too high, it will allow a larger scope for abnormal profits being made by the firm that has exercised market power. If the price cap is set too low, it may deter investment into the market when it is needed.
241. The Authority considers the MRCP value derived based on the current methodology may not set the price cap high enough which may prevent some other forms of peaking capacity from entering the market, limiting competition and innovation in the market place.
242. The Authority considers, as a principle, the price cap for capacity offers into a capacity auction should be set based on the reasonably expected costs pertaining to the most expensive form of new peaking capacity, located in the SWIS. Whilst the principles for setting the EPLs are clearly laid out in the Market Rules, the principles for setting the MRCP is not explicitly stated in the Market Rules. The Authority considers this principle for setting the MRCP should be clearly stated in the Market Rules which should then flow through in the development and review of the MRCP Market Procedure.
243. The Authority recommends the IMO should review the appropriateness of the current calculation formulas and the estimation methods of the input parameters described in the MRCP Market Procedure for setting the MRCP, as a price cap for capacity offers into a capacity auction, in according with the above principle highlighted by the Authority, and make amendments as required. The Authority recommends that this review be undertaken as part of the IMO's next five-yearly MRCP Market Procedure review, due in 2015.

⁷² The IMO publishes its calculation spreadsheet each year for calculating the MRCP value. Refer <http://www.imowa.com.au/mrcp>

Recommendation 6

Section 4.5

The principles for setting the MRCP as a price cap for the purpose of market power mitigation should be clearly stated in the Market Rules. As a principle, the MRCP should be set based on the reasonably expected cost pertaining to the most expensive form of new peaking capacity, located in the SWIS.

The IMO should review the appropriateness of the methodology and estimating methods regarding the input parameters in the MRCP Market Procedure in accordance with the principles for setting the MRCP and make amendments as required.

This review should be undertaken as part of the IMO's next five-yearly review of the MRCP Market Procedure, due in 2015.

4.6 Other matters

4.6.1 *Annual review of the MRCP value*

244. Clause 4.16.3(b) of the Market Rules requires that the IMO must follow the documented Market Procedure to annually review the value of the MRCP.
245. In its Consultation Paper, the Authority sought comments from stakeholders on the appropriateness of the required annual review of the MRCP value and whether the frequency of the review should be modified. The Authority received no specific comments on this point.
246. The Authority considers that the annual review process of the MRCP conducted by the IMO is substantial and it imposes higher costs to the market each year. The Authority considers it is appropriate to consider reducing the frequency of the substantial review and streamlining the review process which will serve to promote greater efficiency to the market and better achievement of the Wholesale Market Objectives.
247. For example, the Authority considers there is some merit in undertaking a thorough MRCP review every three years, with an appropriate escalator being applied to the MRCP in the interim between reviews. The Authority considers the IMO should also have the ability to conduct a thorough review at any time between the reviews, should there be any significant changes in the market where it warrants such a review.
248. The Authority recommends these considerations should be examined further as part of the IMO's next five-yearly review of the MRCP Market Procedure.

Recommendation 7

Section 4.6.1

As part of the IMO's next five-yearly review of the MRCP Market Procedure, the IMO should consider undertaking a thorough MRCP review every three years, with an appropriate escalator being applied to the MRCP between reviews. This should include provision for the IMO to conduct a thorough review, at any time, should there be any significant changes in the market.

4.6.2 *Five-yearly review of the MRCP methodology*

249. Clause 4.16.9 of the Market Rules requires that at least once in every five year period, the IMO must review the Market Procedure for setting the MRCP and must undertake a public consultation process in respect of the outcome of the review. The MRCP Market Procedure sets the methodology and the process for calculating the MRCP value. Effectively, this requires the IMO to review the methodology for calculating the MRCP within every five years.
250. In submissions to the Authority, both Alinta Energy and Verve Energy noted concerns that there is overlap in the five-year MRCP methodology review requirement on the Authority and the five-year MRCP Market Procedure review requirement on the IMO. They suggest that further clarifications to the specific scope of each of these reviews are required to remove any unnecessary duplication.
251. The Authority notes the requirement in the Market Rules for the Authority to undertake a review of the methodology for setting the MRCP every five years and the requirement for the IMO to review the MRCP Market Procedure outlining the methodology and processes for calculating the MRCP at least every five years. Based on comments received from stakeholders, the Authority understands these two requirements may lead to confusion in relation to any overlapping functions between the IMO and the Authority. The Authority considers that its review should focus on the high level concepts and principles for setting the MRCP as a regulatory intervention measure. The IMO's review should ensure these principles are carried through consistently in the implementation of the methodology. The Authority recommends that the relevant clauses in the Market Rules be amended to reflect this.

Recommendation 8

Section 4.6.2

The relevant clauses in the Market Rules should be reviewed and modified to clearly identify and delineate the nature and scope of the reviews that are required of the Authority and the IMO.

4.7 Conclusion

252. Given the current stage of market development and the structural issues that may have significant influences on competition in the capacity market of the WEM, the Authority considers it is appropriate to retain a price cap, i.e. the MRCP, for capacity offers into the Reserve Capacity Auction.
253. The Authority considers that the link between the MRCP, as the price cap for the purpose of market power mitigation, and the RCP, the price for capacity, as it currently stands, should be broken. Thus, the Authority's review of the MRCP methodology has focused on the underlying principles of the methodology for setting the price cap for offers into a capacity auction. The use of the MRCP in setting the administered capacity price, i.e. the RCP, when a Reserve Capacity Auction is cancelled, is not within the scope of this review.
254. The Authority considers the principles for setting the MRCP should be clearly stated in the Market Rules. As a principle, the Authority considers the price cap for capacity offers should be based on the reasonably expected cost of the most expensive form of new peaking capacity, located in the SWIS.
255. The Authority is of the view that the current methodology for setting the MRCP delivers the expected average cost rather than the expected maximum cost of the reference power plant. This may have the potential to restrict other forms of peaking capacity entering the market. The Authority considers that the IMO should review the appropriateness of the current methodology in the MRCP Market Procedure in accordance to the principle highlighted by the Authority and make amendments as required. This review should be undertaken as part of the IMO's next five-yearly review of the MRCP Market Procedure, due in 2015.
256. As part of the IMO's next five-yearly review, the Authority considers that the IMO should further investigate changes to the current annual review process and the possibility for conducting a thorough MRCP review every three years, with an appropriate escalator being applied to the MRCP in the interim between reviews; and the IMO will have the ability to conduct a thorough review, at any time between the reviews, should there be any significant changes in the market.
257. The Market Rules require the Authority to undertake a review of the methodology for setting the MRCP every five years, with a separate requirement for the IMO to review the MRCP Market Procedure outlining the methodology and processes for calculating the MRCP at least every five years. This appears to have caused some confusion in regard with the roles of the two agencies. Hence, the Authority recommends that the relevant clauses in the Market Rules be reviewed and modified to clearly identify the nature and scope of the reviews that are required of the Authority and the IMO, respectively.
258. The Authority notes this review of the MRCP methodology does not replace the review of the RCM that it has recommended the PUO to undertake, nor does it replace the work that the IMO is currently pursuing, based on the previous work undertaken by the RCMWG, in relation to the RCM.

Appendix 1: The requirements of the Authority's review of the methodology for setting the MRCP and EPLs mapped to the sections of this report

Clause 2.26.3 of the Market Rules requires that the Authority's review of the methodology for setting the MRCP and the EPLs examine a list of items. The table below summarises the relevant sections in this report that are included in addressing these requirements.

Market Rule clause	Market Rule reporting requirement	See report section
2. 26.3 (a)	The level of competition in the market	2.1
2. 26.3 (b)	The level of market power being exercised and the potential for the exercise of market power	2.2
2. 26.3 (c)	The effectiveness of the methodology in curbing the use of market power	3.5, 4.4
2. 26.3 (d)	Historical Reserve Capacity Offers and the proportion of Reserve Capacity Offers with process equal to the Maximum Reserve Capacity Price	4.3
2. 26.3 (e)	Historical STEM Bids and STEM Offers and the proportion of STEM Bids and Offers with prices equal to the Energy Price Limits	3.3
2. 26.3 (f)	The appropriateness of the parameters and methodologies in clause 4.16 and the Market Procedure referred to in clause 4.16.3 for recalculating the Maximum Reserve Capacity Price	4.5
2. 26.3 (g)	The appropriateness of the parameters and methodologies in clause 6.20 for recalculating the Energy Price Limits	3.6
2. 26.3 (h)	The performance of the Reserve Capacity Auctions, STEM Auctions and Balancing in meeting the Wholesale Electricity Market Objectives	3.4, 4.3
2. 26.3 (i)	Other matters which the Economic Regulation Authority considers relevant	3.7, 4.6

Appendix 2: Evolution of the methodology for calculating EPLs

Since market commencement, there have been two primary Rule Changes that altered the methodology in calculating the EPLs.

In February 2008, the IMO submitted a Rule Change proposal on the EPLs Methodology (RC_2008_07). The IMO proposed the following changes to the cost assumptions and methodology for determining the EPLs:

- At the time, the Market Rules prescribed the use of the average of the heat rates at minimum capacity and maximum capacity of a 40 MW open cycle gas turbine generating station in the calculation of the EPLs. It was proposed that the Market Rules be amended to instead prescribe the use of the heat rate at the relevant minimum capacity, to ensure that the resultant EPLs cover the cost of the marginal generator for all load levels.
- The Market Rules were silent on any specific treatment of start up costs. The IMO proposed that the inclusion of the start up costs be prescribed so as to ensure that relevant costs associated with start up are not excluded in future reviews.
- The IMO proposed that the clauses pertaining to the review of Maximum Shutdown Cost be deleted from the Market Rules, as the opportunity costs of a shutdown can be recovered through the pay-as-bid prices under the provisions of the Market Rules, and the cost of shutting down a unit would also be covered by the proposed inclusion of start up costs.

The changes proposed in RC_2008_07 were supported by Market Participants and these were approved by the IMO. The amendments to the Market Rules commenced operation in August 2008.

In December 2009, the IMO submitted a Rule Change proposal on the EPLs Methodology and Consultation Process (RC_2009_35). The IMO's Rule Change proposal sought to amend the Market Rules to:

- Replace "Profit Margin" with "Risk Margin", where "Risk Margin" refers to the margin between the price cap and the expected highest short run cost generating works in the SWIS, in order to allow for the uncertainty faced by the IMO in setting the price limits to be accurately reflected when annually reviewing its appropriateness.
- Clarify that the IMO will publish Draft Reports and seek public consultation only when undertaking the annual review required under the Market Rules.
- Allow for a second consultation period, if required, after submissions have been received on the Draft Report.

Following the publication of the IMO's draft Rule Change Report, the IMO also sought to remove the requirement to adjust the Maximum STEM Price for CPI changes. The proposed changes in RC_2009_35 were accepted and amendments to the Market Rules commenced operation in June 2010.

Appendix 3: Summary of changes to the MRCP Market Procedure

The MRCP Market Procedure details the methodology that the IMO must use and the steps that the IMO must undertake in determining a value for the MRCP. There has been a number of amendments to the MRCP Market Procedure since it was put in place in 2008. A summary of the Procedure Change Proposals is provided below.

Procedure Change Proposal	Date submitted	Date completed	Effective date	Key amendments
PC_2008_06	1/8/2008	10/10/2008	13/10/2008	<ul style="list-style-type: none"> The new Market Procedure for determining the MRCP was developed following the approval of the Rule Change Proposal (RC_2008-11) in July 2008, amending a range of clauses in the Market Rules in respect of the determination of the MRCP based on outcomes from the working of the MRCP Advisory Group.
PC_2008_14	30/10/2008	3/12/2008	4/12/2008	<ul style="list-style-type: none"> Amended to correct a typographic error in the equation for the nominal return on debt in the WACC calculation.
PC_2009_12	20/11/2009	30/3/2010	1/4/2010	<ul style="list-style-type: none"> Removed the prescribed values of the Major components of the WACC to allow updated values to be included in the determination of the WACC.
PC_2010_04	9/8/2010	4/10/2010	11/10/2010	<ul style="list-style-type: none"> Restated the values for the Major components of the WACC that were removed under PC_2009_12.
PC_2011_06	6/9/2011	21/10/2011	24/10/2011	<ul style="list-style-type: none"> Included a provision for an inlet air cooling system in the definition of the model power station (step 2.1). Amended the Fixed Fuel Cost to include an allowance to initially fill the fuel tank with sufficient distillate for 14 hours of operation. Included in step 2.7.2(a) where the minimum land size available is greater than 3ha. Amended the effective compensation period for the total investment costs from 2 years to 6 months, after the escalation of values in the cost estimates in respect of power station, transmission, switchyard and O&M costs is to be performed to April of Year 3. Included an allowance for annual asset insurance costs for the model power station within Fixed O&M Costs. Amended the methodology for forecast Transmission Connections Works costs to be based on historical connection costs and relevant access offers determined by Western Power. Included debt issuance costs within the WACC and removed the corresponding debt financing costs from within margin M. Renamed the "Minor" and "Major" components of the WACC in step 2.9.8 to "Annual" and "5-yearly" and reclassified the Review Frequency of some WACC components. Provided the IMO with a discretion to nominate a method for determining the Debt Risk Premium that is consistent with current accepted Australian regulatory practice.
PC_2012_08	12/11/2012	11/1/2013	15/1/2013	<ul style="list-style-type: none"> Amended the value of Franking Credit (Gamma) used in the calculation of the WACC from 0.5 to 0.25. Amended the footnote on page 15 of the MRCP Market Procedure to note that the

Procedure Change Proposal	Date submitted	Date completed	Effective date	Key amendments
				<p>'Bond-Yield Approach' methodology was broadly upheld on appeal to the Australian Competition Tribunal in June 2012 and the IMO's intent to amend this Market Procedure in the near future to implement the 'Bond-Yield Approach'.</p> <ul style="list-style-type: none">• Other amendments of administrative nature to ensure consistency with the Amending Rules resulting from the Rule Change Proposal: Competitive Balancing and Load Following Market (RC_2011_10).