Public Version

2009 Annual Wholesale Electricity Market Report for the Minister for Energy

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Economic Regulation Authority
WESTERN AUSTRALIA

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Executive Summary

The *Wholesale Electricity Market Rules* (**Market Rules**) require the Economic Regulation Authority (**Authority**) to provide to the Minister for Energy a report on the effectiveness of the Wholesale Electricity Market (**WEM**) (**Minister's Report**) at least annually, and more frequently where the Authority considers that the WEM is not effectively meeting the Wholesale Market Objectives. The Minister's Report is to include any recommended measures to increase the effectiveness of the WEM in meeting the Wholesale Market Objectives.

The Authority considers that this report fulfils the Authority's obligations under the Market Rules in providing an assessment of the effectiveness of the WEM.

Through its ongoing monitoring of the WEM, and in compiling this report, the Authority has identified a number of challenges facing the market. An overview of the most significant of these challenges is provided in this Executive Summary together with a précis of the Authority's Recommendations and Findings.

Overview of market outcomes

The Authority considers that the WEM has generally operated effectively since market commencement, and that outcomes in the WEM are continuing to reflect increasing competition in both the generation and retail sectors.

In the generation sector, a number of new generation participants have entered the WEM since market commencement. There has also been an increase in the number of generators with significant facilities that have been assigned Capacity Credits. In the 2007/08 Capacity Year, Verve Energy accounted for around 77 per cent of assigned Capacity Credits. By the 2011/12 Capacity Year, this will fall to 57 per cent of all Capacity Credits. This is the result not only of the entry of substantial new generators – both NewGen and Griffin Power[1] will each have two significant power stations in the WEM by the 2011/12 Capacity Year – but is also due to an increase in the Capacity Credits accounted for by smaller independent generators (see Section 4.1.5 for details).

Importantly, the Authority notes that since WEM commencement, the market has delivered new generation plant across a range of different technologies and fuel types. By the 2011/12 Capacity Year, the WEM will have seen Capacity Credits assigned to new investments in coal, gas, wind, biomass and waste gas generation plant as well as to Demand Side Management (**DSM**) projects. For instance, NewGen has invested in two new gas fired generation plants, Griffin Power has invested in two new coal fired generation plants, and there have been additional investments by new entrants in biomass, waste gas and DSM projects.

Competition in the retail sector has been slower to develop. In part, this reflects that full retail contestability (**FRC**) has not yet been introduced in Western Australia, so at present only larger use customers are contestable. Nevertheless, there is evidence that

[1] On 3 January 2010, Griffin Coal was placed into voluntary administration. While two coal fired power stations, owned by related companies, continue to operate, media reports indicate that there are uncertainties surrounding coal supplies to these power stations. The Authority considers that these matters are of a commercial nature and are not a reflection of the operation of the WEM. The Authority is not aware of any implications that the voluntary administration of Griffin Coal has for the future evolution of the WEM.

competition for these larger customers has been increasing, as indicated by higher customer churn rates[2] (see Section 4.1.5 for details). Just as a competitive generation sector provides retailers with more options for buying electricity, a competitive retail sector provides generators with more options for selling electricity.

These trends toward increased competition are reflected in WEM outcomes, with increased volumes traded in the Short Term Energy Market (**STEM**) and increased Bilateral Contracting between Market Participants other than Verve Energy and Synergy. The Authority considers that these are positive signs for the evolution of the market.

Need for coordination

Notwithstanding the positive progress to date, the WEM, like all energy markets, will need to continually evolve. A key aspect of the orderly functioning of the WEM is the process through which market development matters are considered and implemented.

A number of the issues addressed in this report – including some of the major challenges discussed in this Executive Summary – were also raised in the Authority's 2008 Minister's Report. The Authority recognised that a range of issues affecting the WEM (for example, handling network connection applications) can be dealt with through existing frameworks, such as the WEM Rule change process. The Authority also concluded that a number of market design, regulatory and structural issues affecting the WEM (for example, the appropriateness of the current 'unconstrained' approach to network planning) required high level input from policy makers, through a recommended 'road map' process.

Since the Authority's work on the 2008 Minister's Report, views and recommendations on the ongoing evolution of the WEM have continued to be expressed from a number of sources, including:

- **Market Rules Evolution Plan** – The Independent Market Operator (**IMO**) has published a three-year Market Rules Evolution Plan, which is intended to help shape the future development of the WEM in a manner that is complementary to the road map process. The IMO has presented a proposed work programme to the Market Advisory Committee (**MAC**), which sets out a process for progressing work on priority issues identified by stakeholders.
- **Oates Report** – The Oates Report was commissioned by the Minister for Energy to investigate the causes of Verve Energy's current financial difficulties and performance, and presents options that might improve Verve Energy's financial outlook. The Oates Report made a number of key findings and presented a range of recommendations regarding various market design and broader industry issues which are discussed in the body of this report. A Verve Review Implementation Coordination Committee has since been formed to progress Market Rules changes, changes to the Vesting Contract and to prepare a Generation Outlook.
- **Strategic Energy Initiative** – The government has commenced work on a Strategic Energy Initiative (**SEI**) for the development of the energy sector in Western Australia out to 2030. The SEI will outline the plans, strategies, policies and regulatory frameworks needed to ensure a range of energy supply options are available to meet the State's future energy needs. The Office of Energy released a SEI Issues Paper in December 2009, and will undertake ongoing consultation during 2010 with the objective of completing the review by the end of 2010.

[2] Churn rate, when applied to a customer base, refers to the proportion of contractual customers or subscribers who leave a supplier during a given time period.

- **AEMC Climate Change Report** – The Australian Energy Market Commission (**AEMC**) has completed its Review of Energy Market Frameworks in Light of Climate Change Policies. The AEMC considered whether the existing market frameworks in Australia – the rules and regulations governing market behaviour – will continue to deliver efficiency objectives following the commencement of the Carbon Pollution Reduction Scheme (**CPRS**) and expanded Renewable Energy Target (**RET**). The AEMC made specific comments on the impacts of climate change policies on the WEM and these are discussed in the body of this report where relevant.
- **Energy Supply Association of Australia (ESAA) "Western Australian Energy Market Study"** – On 30 November 2009, the ESAA published a report outlining its recommendations for reforms to Western Australia's energy market. In respect of the South West Interconnected System, the ESAA report covers many points discussed in this Minister's Report. The ESAA develops a set of principles to provide a framework for thinking about reforms that could best promote efficient outcomes in the energy market in the long term.
- **Interaction with the Authority** – Discussions that the Authority held with stakeholders and submissions in response to the Authority's discussion paper, issued on 15 July 2009, raised many of the market design, regulatory and structural issues affecting the WEM as matters requiring continued attention.

The Authority considers that these reports and interactions have contributed to the debate around key issues affecting the WEM, and that the IMO's Market Rules Evolution Plan provides a useful framework to progress many of the issues identified by the Authority as a part of the road map approach proposed in its 2008 Minister's Report.

However, the Authority notes that there is a continuing lack of clear and coordinated policy approach to a range of key market design, regulatory and structural issues. The Authority is concerned that with multiple reviews and processes currently underway, there is a potential for confusion among stakeholders as to the evolution of policy on key issues.

The Authority considers that, at just over three years since market commencement, the WEM has reached the stage where a number of market evolution issues need to be progressed to address a number of major challenges.

Given this, the Authority reiterates its recommendation from its 2008 Minister's Report that there needs to be a process put in place for laying out a strategy for the future development of the WEM (**WEM Future Strategy**), which further promotes the Wholesale Market Objectives.[3] The Authority is strongly of the view that this market evolution process should be transparent and consultative, and be coordinated by the Office of Energy, so that the consideration of any changes (consistent with the Wholesale Market Objectives) is at 'arm's length' from the perspective of State Government, i.e. these changes are not formulated in isolation by the Government. Where matters are of sufficient importance to warrant Government decisions, these decisions should again be based on recommendations developed through such a process. This is particularly the case where the Government owns significant infrastructure in the WEM. This approach mirrors the market development process of the National Electricity Market (**NEM**) in the Eastern States. In the absence of an arm's length process which is coordinated, transparent and consultative, market confidence in WEM development could be

[3] The Authority notes that, on 17 November 2009, the Minister for Energy released and invited comment on a discussion paper on the Strategic Energy Initiative 2030, and that one objective of the initiative is to ensure market and regulatory frameworks are responsive and flexible to meet the objectives of Government, industry and consumers.

undermined and timely private sector investment put at risk. Indeed, industry participants have expressed the view to the Authority that the uncertainty created by the multiple reviews and processes currently underway will impact on investment decisions.

Importantly, the Authority considers that the objective of oversight and coordination should be to guide continued market evolution so as to promote the Wholesale Market Objectives.

Environment for planning decisions

The Authority notes that the Oates Report states that there is a fundamental policy decision to be made on the type of market environment that the State wants in the future: a 'directed' model involving significant Government involvement in investment, planning and operations or a 'competitive' model emphasising competition and private sector participation in the fuel, wholesale generation and retail elements of the supply chain in order to drive efficiency.[4]

The Authority's strong view is that the Wholesale Market Objectives are best achieved under a competitive model, and considers that the objective of this process should be to ensure that market frameworks promote competition and private sector participation while ensuring the efficient, safe and reliable production and supply of electricity. The Authority notes that outcomes to date suggest that market processes can drive appropriate outcomes, including in regard to generation investment decisions, and considers that there is no evidence of a requirement for significant Government involvement in generation investment and planning decisions in the WEM.

The Authority notes that the AEMC Climate Change Report provided a similar view on generation investment and planning decisions in the WEM.[5] In particular, the AEMC Climate Change Report noted that the desired outcome is for installed generation capacity to track required capacity levels over time through the decentralised decision making of individual market participants in response to market signals. The AEMC concluded that the existing energy market frameworks in Western Australia are sufficiently resilient; in particular, the AEMC noted that the existing Reserve Capacity Mechanism has resulted in the presence of adequate generation capacity over the short-term, and is likely to attract new investment over the longer term.

Overview of major challenges

Structure of the electricity industry

The Authority considers that, in order for the market to operate effectively and to meet the Wholesale Market Objectives, it is important that competition develops at both the generation and retail levels. In this regard, the market has made positive steps in the right direction, as discussed above.

The Authority notes that the Minister for Energy announced on 26 August 2009 that the Government would not remerge Verve Energy and Synergy.[6] The Authority welcomes

[4] Oates Report, page 10.

[5] AEMC Climate Change Report, page 154.

[6] Government Media Office - Ministerial Media Statements, Minister for Energy, *State's energy future outlined,* http://www.mediastatements.wa.gov.au/Pages/WACabinetMinistersSearch.aspx?ItemId=132400&minister=Collier&admin=Barnett

this decision for the reasons given in the 2008 Minister's Report, namely that a merger would undermine competition by deterring the entry of new generator and retailer participants in the WEM, as well as undermining private investment in new generation facilities.

However, the Authority notes that the Minister for Energy's press release referred to the need to make significant changes to the Market Rules and the Vesting Contract to address Verve Energy's financial problems. The Authority recognises that changes to the Market Rules and the Vesting Contract may be necessary to help address Verve Energy's financial problems. In particular, the Authority concurs with the view expressed in the Oates Report that the Vesting Contract should be priced at commercial levels so that any subsidies to provide Synergy with a reasonable retail margin are transparent (rather than being provided through favourable pricing under the Vesting Contract). The Authority also considers that there is an urgent and growing need to progress work on changes to existing Balancing arrangements (including ensuring that Verve Energy can recover the efficient costs of providing Balancing services). However, the Authority would be unlikely to support changes to the Market Rules or the Vesting Contract intended to address Verve Energy's financial problems if such changes undermine the operation of open and competitive markets in electricity and generation capacity. For example, changes to the bilateral arrangements of Verve Energy and Synergy that would result in an outcome that is effectively equivalent to the merger of these two dominant government owned Market Participants would be a concern.

The Authority notes that with market evolution, and in particular, an increase in the penetration of intermittent generation, there is a greater requirement for certain services, including a greater demand for the provision of Ancillary Services. The Authority considers that changes to the treatment of intermittent generation in the Market Rules could include an Ancillary Service cost recovery regime or a requirement on operators of intermittent plant to procure additional Load Following Services.

The Authority considers that enhanced efficiency would be realised if Ancillary Services were procured from a wider field of providers. The IMO's 'Ancillary Service Standards and Requirements Study' was published in November 2009. One of the recommendations of that report is that changes should be made to reduce the dominance of Verve Energy in the provision of Ancillary Services.[7]

Retail tariffs and full retail contestability

Two important steps towards a competitive market are the achievement of cost reflective retail tariffs and the introduction of FRC.

Retail tariffs in the WEM are significantly below cost reflective levels. The Authority notes that there has been progress on regulated retail tariffs since the 2008 Minister's Report, with regulated retail tariffs increasing on 1 April 2009 and 1 July 2009 by 26 per cent in total. The Authority also notes that the Minister for Energy announced on 31 October 2009 the likelihood that a similar retail tariff increase will occur during 2010. However, regulated tariffs for small retail customers remain below cost reflective levels. Furthermore, increases in costs due to the proposed CPRS and the expanded RET are likely to widen the gap between actual tariffs and cost reflective levels. The Authority therefore recommends that the Minister for Energy build on the recent retail tariff decisions and move regulated retail tariffs to full cost reflective levels as soon as possible.

[7] See IMO web site, *Ancillary Service Standards and Requirements Study Final Report*, 6 November 2009, http://www.imowa.com.au/f685,166353/166353_AS_Study_Final_Report.pdf

In regard to the introduction of FRC, the Authority recommends that the costs and benefits of introducing FRC should be investigated and, in the event that FRC is found to have a net benefit, that a pathway towards the introduction of FRC be established. Ultimately, until FRC is introduced, retail competition will be constrained and this will limit the effectiveness of the market.

The Authority considers that a transition to cost reflective retail tariffs and the introduction of FRC will strongly support the future development of the WEM.

Market and network challenges

The Authority considers that there are four key issues relating to the design and operation of the market and the network that require attention at the policy level.

- The basis for network planning in the WEM.
- Delays in processing network access applications.
- The decommitment of base load thermal plants overnight.
- The need to improve real-time Balancing arrangements to more efficiently match system generation and load.

Each of these four issues is briefly summarised below and discussed more fully in the body of this report.

Network planning

The 'unconstrained' network planning approach that is currently used in the WEM allows for all generators connected to the South West Interconnected System (in operation or not) to be generating at the same time under the worst credible system load and generation patterns. Where spare capacity is not available network augmentation is required to allow new generators to be connected. In contrast, under the constrained network planning approach in use in the NEM, generators can be connected to the network even in circumstances where their access to the network may be limited and access for existing generators could be adversely affected as well during periods of high load.

The unconstrained network planning approach can require significant network investment to ensure there is sufficient network capacity to provide unconstrained access to all generators. The Authority considers that the unconstrained network planning approach can potentially lead to inefficient over-investment in the grid. This is particularly the case in circumstances where the relevant new generator is intermittent and hence does not always operate at full capacity at peak demand times.[8] For this reason, the Authority considers that, with the passing into law of the expanded RET, consideration of the network planning approach in the WEM is a priority issue.

While there may be benefits to a move from an unconstrained to a constrained network planning approach, the Authority considers that a move towards a constrained network planning regime would require a substantial rethinking of the design of the WEM. The Authority considers that the main challenges will be in assessing the impact of a change in network planning approach on the WEM's Reserve Capacity Mechanism and STEM, and enabling System Management to dispatch in a constrained network operations model.

[8] Although Intermittent Generators only receive Capacity Credits for a small proportion of their maximum generating capacity, they are required to be connected to the network so their maximum capacity can be delivered to the market.

The Authority notes that the IMO has no responsibility or mandate for dealing with issues relating to new network connections or network planning in the WEM. Therefore, arrangements need to be made for an appropriate body to review network planning as a matter of priority.

Network access applications

Under the Market Rules, applications for certification of Reserve Capacity for new facilities require that the applicant can show that the facility is entitled to network access. As a result, delays in receiving a network access offer from Western Power Networks can delay participation in the Reserve Capacity Mechanism and thereby lead to delays in generation investment.

Western Power Networks' Application and Queuing Policy (**AQP**) is an important factor in the time taken for a network access offer to be received by the applicant. In particular, when there is a lengthy network access queue, new applications for network access can take a number of years to process. This is likely to be an increasingly important issue with the introduction of the expanded RET, given the expected large number of applications for network access for renewable projects.

The Authority considers that the management of the network access queue is important for the ongoing development of the WEM. However, the Authority notes that Western Power Networks has stated that it is currently in the process of developing proposed amendments to its AQP, with a view to reducing the average connection application processing time and to ensure project applications are prioritised on a more appropriate basis. Western Power Networks noted that it intends to submit proposed changes to the AQP to the Authority in early 2010. The Authority will review these proposed changes and respond to them through the subsequent AQP review process.

Decommitment of thermal plant

Base load thermal plants are designed to run on a more or less continuous basis. If base load thermal plants are required by System Management to decommit and recommit (turn off and turn on), these plants will typically incur higher costs and will operate with lower reliability.

There is an emerging need for System Management to decommit base load thermal plants overnight, due to a combination of increasing amounts of wind generation (which supplies energy to the market whenever it is able to run) and comparatively low off-peak and 'trough' period demand. Climate change policies, in particular the expanded RET, are likely to lead to a significant increase in wind generation, potentially increasing the need to shut down base load thermal generating plant overnight.

The Authority considers that the ability of wind generation to supply energy to the market whenever it is able to run can result in dispatch on a basis other than market bids and offers by Market Participants. In the Authority's view, dispatch on a basis other than bids and offers can result in dispatch outcomes where higher cost generators operate instead of lower cost generators. Ultimately, this may result in inefficient operation of generation plant as well as inefficient investment in generation plant.

The MAC's Renewable Energy Generation Working Group (**REGWG**) has been formed to investigate the issues related to the treatment of intermittent renewable energy generation in the WEM. The Authority considers that the REGWG is the appropriate forum to address issues related to renewable generation, and that the outcomes of the REGWG are important to the further development of the WEM.

The Authority notes that the work of the REGWG has been underway for some time, with the IMO's recent tender requests having sought advice on a number of issues concerning intermittent generation. Given that the treatment of intermittent renewable energy generation in the WEM has the potential to affect investment decisions, the Authority considers that the work of the REGWG should be completed as soon as possible. The Authority will continue to monitor the progress of the REGWG.

Competitive Balancing

Under the Market Rules, Market Participants submit bids and offers a day ahead of the actual Trading Day. However, the market needs to be balanced in real-time. Under the Market Rules, System Management schedules Verve Energy generation plant to balance the system around Market Participants' day-ahead bids and offers. In the hours leading up to real-time dispatch, System Management reschedules Verve Energy's generation plant to balance the system as required.

The Authority considers that a move to the provision of competitive Balancing services, in which Market Participants compete to balance the market in real-time, could address a range of interrelated market design issues in the WEM.

- Balancing services by Verve Energy are presently settled based on the Marginal Cost Administrative Price,[9] which may not reflect its efficient costs of providing Balancing services. The Balancing service provider (currently Verve Energy) should at least recovers its costs.
- The pricing of Balancing services on a competitive basis could help manage the overnight decommitment of thermal plant. If Balancing is competitive, decisions on the dispatch of thermal plant overnight can be based on Market Participants' bids and offers for those plants (including bids and offers to supply Balancing). Currently, balancing relies on System Management being required to make complex and non-transparent efficiency/security trade-offs at low load times, which can be better informed through a competitive process for the provision of such services.

While there are likely advantages to creating a set of market arrangements in which both Verve Energy and independent generators can offer to provide Balancing services, any changes to the existing Balancing arrangements must recognise that outcomes in the Balancing market will be affected by the competitiveness of the generation sector. In particular, the Authority notes that unless carefully implemented, competitive Balancing could enable major generators, including Verve Energy as the largest generator in the WEM, to earn prices in excess of its costs of supply.

The Authority considers that there is an urgent and growing need to progress work on examining the relative merits of various changes to existing Balancing arrangements, including, but not limited to, competitive Balancing. In this context, the Authority notes that competitive Balancing is the top-ranked issue for the IMO's Market Rules Evolution Plan, and that the IMO has stated that it intends to move ahead with consultation on options for changes to existing Balancing arrangements. In light of the lack of progress on the road map, as compared to the proactive work of the IMO, the Authority considers that the IMO could progress work around the examination of competitive Balancing through the Market Rules Evolution Plan. Oversight could be provided by the Office of Energy to ensure that the direction of the analysis is consistent with the Wholesale Market Objectives. The Authority recommends that resources be made available to the Office of Energy for this task.

[9] The price calculated from the market supply curve and adjusted system demand.

Government's climate change policies

The CPRS and the expanded RET will have important and substantial impacts on the WEM. As the requirement for renewable energy generation increases under the expanded RET, and as thermal generators face a carbon price under the CPRS, substantial changes will be required to the patterns of operation of generation plant and investment in generation plants. These changes have already commenced under the existing Mandatory Renewable Energy Target, but will become more significant over the next few years, particularly with the scheduled introduction of the CPRS in 2011/12.

The introduction of the CPRS and the expanded RET will have wide ranging implications for the WEM and for related upstream fuel markets and downstream retail markets. Key issues raised by the introduction of the CPRS and the expanded RET are noted below.

- The extent to which the network access application process can manage the expected increase in applications, particularly for renewable energy generation plants, and not create delays or barriers to efficient investment in new generation plants.
- The implications of an increase in investment in renewable generation plant for the 'unconstrained' network planning approach that is currently in use in the WEM. In particular, with an increase in intermittent generation, an 'unconstrained' network planning approach may result in inefficient investment in the network.
- The extent to which investment incentives for intermittent generation under the current Market Rules, combined with the incentives provided by future climate change policies, are likely to promote efficient market outcomes, i.e. there may be inefficient investment in intermittent generation if capacity payments under the Reserve Capacity Mechanism do not reflect the true contribution made by intermittent generation to system security taking into consideration RET and CPRS incentives.
- The impact that an increase in the operation of intermittent generation will have on the operation of the electricity system. In particular, with an increase in intermittent generation, there will be an increasing need for thermal generation to operate around the availability of intermittent generation.
- The impact that the CPRS and the expanded RET will have on retail tariffs. These policies will result in increasing costs of supplying electricity and, in order that retailers and customers face appropriate price signals, the framework for determining regulated tariffs will need to account for these increasing costs.

Unless feed-in tariff schemes and solar power credit programs are designed appropriately and the level of tariff or credit is appropriate, the Authority notes the potential for renewable energy buy back and rebate schemes to lead to inefficient investment and utilisation of State resources. State Government renewable schemes and the impacts of the CPRS and the expanded RET on the WEM, are discussed in more detail later in this report.

Summary of Recommendations and Findings

Recommendation 1

Section 1.4

The Authority considers that there are a number of market evolution issues that need to be progressed in order to address major challenges facing the Wholesale Electricity Market. With multiple reviews and processes currently underway, the Authority considers that there is potential for uncertainty among stakeholders as to how these issues will be progressed.

The Authority considers that a process is required to lay out a strategy for the future development of the Wholesale Electricity Market (WEM Future Strategy). This process needs to be transparent and consultative, and be coordinated by the Office of Energy, so that the consideration of any changes (consistent with the Wholesale Market Objectives) is at 'arm's length' from the perspective of State Government. Where matters are of sufficient importance to warrant Government decisions, these decisions should be based on recommendations developed through the WEM Future Strategy.

In relation to the Independent Market Operator's Market Rules Evolution Plan, the Authority recommends that there is appropriate engagement between the Independent Market Operator and the Office of Energy to ensure appropriate policy input and to ensure that the Market Rules Evolution Plan is consistent with the WEM Future Strategy.

Finding 1

Section 4.1

On the whole, the Authority considers that the Wholesale Electricity Market has operated effectively since market commencement, and that outcomes in the market are responding to an increase in competition in both the generation sector and (to a lesser extent) the retail sector. The Authority considers that these are positive signs for the evolution of the market. Nevertheless, the Authority notes that the market remains concentrated and that there are a number of ongoing issues highlighted in this report that the Authority believes need to be addressed in order for the market to more effectively meet its objectives.

Recommendation 2

Section 4.2.3

The Authority considers that clarity of the Wholesale Market Objectives is crucial to ensuring that the ongoing evolution of the market is appropriate.

The Authority recommends that the proposed WEM Future Strategy should consider whether there are benefits to amending the Wholesale Market Objectives to improve their clarity. This may facilitate clearer assessment of the market's performance and future development.

Finding 2

Section 4.3.1

In order to be eligible to receive Capacity Credits,

the Market Rules require that a new facility has a network access offer. As a result, the process for receiving a network access offer can have a significant impact on investment in the Wholesale Electricity Market.

A number of issues with the process for receiving a network access offer have been raised by stakeholders. Western Power Networks is reviewing its Application and Queuing Policy, with the intention of proposing revisions to reduce the average connection application processing time and to ensure projects are prioritised on an appropriate basis.

The Authority considers that Western Power Networks' process is the appropriate procedure for addressing issues with network access offers. The Authority supports Western Power Networks' intention to submit amendments, and expects to review these amendments under the *Electricity Networks Access Code 2004*.

Recommendation 3

Section 4.3.3

Applicants for network access may be required to make capital contributions for augmentation to the shared network. The arrangements for determining these capital contributions, known as 'deep connection charges', can have a significant impact on investment in the Wholesale Electricity Market.

A number of issues with deep connection charges have been raised by stakeholders.

The Authority recommends that the appropriate approach for deep connection charges be considered as part of changes to the network planning approach, dealt with through the WEM Future Strategy. The Authority considers that this would facilitate decisions that reflect the inter-relationships between deep connection charges and the network planning approach.

Recommendation 4

Section 4.3.4

The ability for a generator connecting to the electricity network to deliver its maximum generating capacity (i.e. 'unconstrained' or 'constrained' access) has significant implications for investments in the network and the operation of the power system.

The unconstrained network planning approach used in the Wholesale Electricity Market may lead to inefficient investment in network assets, increasing the cost of supplying electricity to customers.

The Authority recommends that the Independent Market Operator, the Office of Energy, System Management and Western Power Networks review network planning in the South West Interconnected System, focussing on the competing 'constrained' and 'unconstrained' planning frameworks. The Authority recommends that this review take place as part of the WEM Future Strategy.

Recommendation 5

Section 4.4.2

The Authority notes the Generation Outlook work taking place under the Verve Review Implementation Coordination Committee, which is focused on providing generation scenarios for efficient generation investment decisions.

However, the Authority strongly recommends that generation investment decisions should remain decentralised with Market Participants through the Independent Market Operator's process.

Recommendation 6

Section 4.4.3

The Authority notes that the Reserve Capacity Mechanism has continued to deliver sufficient capacity to the Wholesale Electricity Market.

However, a number of stakeholders have commented on the assumptions and calculations used to determine the Maximum Reserve Capacity Price for the 2010 Reserve Capacity Cycle.

Given this, the Authority recommends that the Independent Market Operator exercises its option to bring forward the review of the methodology for calculating the Maximum Reserve Capacity Price (as set out in Clause 4.16.9 of the Market Rules) prior to its review of the Maximum Reserve Capacity Price for the 2011 Reserve Capacity Cycle.

Recommendation 7

Section 4.5.3

Regarding the extent to which investors in new generation face appropriate locational signals, in the Authority's view, the issue is whether the existing locational signals in the WEM arrangements are adequate or whether additional signals (such as a locational Reserve Capacity Price) are needed.

The Authority recommends that the formerly-active Generation Location Working Group should be re-established to consider this issue under the auspices of the proposed WEM Future Strategy process.

Recommendation 8

Section 4.7.2

The closer alignment of gas and electricity nominations (and/or changes to the timing of the Short Term Energy Market) is a top-ranked issue to be addressed by the Independent Market Operator's 'Market Rules Evolution Plan'.

The Authority recommends that the Office of Energy provide policy input into this process to ensure that work on the Market Rules Evolution Plan reflects broader policy objectives.

Recommendation 9

Section 4.8.1

In the event that there is an imbalance between base load generation capacity and overnight load, there may be a need to decommit base load plant overnight.

The Authority considers that, as long as there is not discrimination between energy options, the market will correct any such imbalance in due course.

In the interim, the Authority recommends that System Management's dispatch decisions, taking into account supply reliability considerations, need to be understood by stakeholders. System Management should be encouraged to widely explain its dispatch rationale to the market.

Recommendation 10

Section 4.8.2

The Authority recommends that the case for a move to competitive Balancing in the Wholesale Electricity Market should be considered. While the Authority considers that work on assessing the benefits of reform to Balancing arrangements can usefully occur within the framework of the Independent Market Operator's Market Rules Evolution Plan, it is important that this work is informed by policy input from the Office of Energy.

Recommendation 11

Section 5.2.7

Significant changes to the treatment of intermittent generation in the Wholesale Electricity Market will have implications for investor certainty.

For this reason, the Authority recommends that the work of the Market Advisory Committee's Renewable Energy Generation Working Group should consider the provision of a clear transition regime to manage changes in the treatment of intermittent generation.

Recommendation 12

Section 5.7.7

The Authority considers that cost-reflective retail tariffs are essential to ensuring that the Wholesale Electricity Market continues to meet its objectives over time.

The Authority recommends that a clear process for determining regulated retail tariffs on a regular basis be established, with the objective of achieving and maintaining cost-reflective regulated retail tariffs. This process needs to ensure that there are clear arrangements for the direct pass-through of changes in network tariffs to retail tariffs.

Recommendation 13

Section 5.7.7

The Authority considers that until full retail contestability is introduced, retail competition will be constrained.

The Authority recommends that the costs and benefits of introducing full retail contestability should be assessed and, in the event that full retail contestability is found to have net benefits, a pathway towards the introduction of full retail contestability should be established.

Recommendation 14

Section 5.8.5

The Authority considers that the displacement schedule under the Vesting Contract is important for fostering competition in the Wholesale Electricity Market.

For this reason, the Authority recommends that the displacement schedule under the Vesting Contract should proceed as originally planned, so that any contractual arrangements between Verve Energy and Synergy move to commercially negotiated bilateral arrangements.

Finding 3

Section 5.9.5

The Authority considers that a relaxation of the 3,000 MW cap on Verve Energy's generation capacity would deter further investment in generation capacity by independent generators, to the detriment of the Wholesale Electricity Market.

INTRODUCTION

1 Background

1.1 Context of this report

The Economic Regulation Authority (**Authority**) is the independent economic regulator for Western Australia. The Authority administers industry-specific legislation in relation to electricity, gas, rail and water.

One of the Authority's responsibilities is to report on the effectiveness of the Wholesale Electricity Market (**WEM**).

Clause 2.16.11 of the *Wholesale Electricity Market Rules* (**Market Rules**) requires the Authority to report on the effectiveness of the market in meeting the Wholesale Market Objectives. Clause 1.2.1 of the Market Rules sets out the Wholesale Market Objectives:

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

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

c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;

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

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

The Market Rules require the Authority to provide to the Minister for Energy a report (**Minister's Report**) on the effectiveness of the WEM at least annually, and more frequently where the Authority considers that the WEM is not effectively meeting the Wholesale Market Objectives. The Minister's Report is to include any recommended measures to increase the effectiveness of the WEM in meeting the Wholesale Market Objectives.

1.2 Process

In preparing this Minister's Report, the Authority conducted a public consultation process. During May 2009, the Authority held meetings with key stakeholders and invited these stakeholders to provide their preliminary views on the effectiveness of the WEM. Subsequently, the Authority released a Discussion Paper[10] on 15 July 2009 to assist interested parties to make submissions on issues relevant to the effectiveness of the WEM. A notice was posted on the Authority's web site advising the release of the Discussion Paper and inviting submissions to be lodged with the Authority by

[10] ERA, *Discussion Paper - Annual Wholesale Electricity Market Report to the Minister for Energy*, July 2009 http://www.era.wa.gov.au/cproot/7765/2/20090715 Discussion Paper - Annual Wholesale Electricity Market Report to the Minister for Energy.pdf

13 August 2009. A list of stakeholders who lodged submissions is provided in Appendix 2 and all submissions received are available on the Authority's web site.[11]

In preparing this Minister's Report, and in forming the views set out in it, the Authority has considered both the comments raised by key stakeholders during the meetings held during May 2009 and the submissions provided to the Authority in response to the Discussion Paper. Where necessary, the Authority has undertaken discussions with stakeholders to clarify comments made in submissions; the Authority has also had regard to these discussions in preparing this Minister's Report.

The Authority has also taken account of the findings of other key reports that relate to the WEM: the *Verve Energy Review* prepared by Mr Peter Oates[12] (**Oates Report**), the Australian Energy Market Commission's (**AEMC**) *Review of Energy Market Frameworks in light of Climate Change Policies*[13] (**AEMC Climate Change Report**) and the ESAA Western Australian Energy Market Study (**ESAA Study**). A précis of these reports is set out below, and the findings and recommendations of these reports are referred to in relevant discussions throughout this Minister's Report. The Authority notes the developments following the Government's consideration of the Oates Report; namely the Verve Review Implementation Coordination Committee and the Strategic Energy Initiative.

Finally, the Authority has also had regard to a range of market data. In accordance with the Market Rules, the Independent Market Operator (**IMO**) has provided the Authority with data and analysis relating to the WEM, which is summarised in Section 3 of this Minister's Report. In forming the views set out in this report, the Authority has considered the data and the analysis provided by the IMO.

1.3 Major reference documents

The Authority has approached the development of this Minister's Report by building on the approach adopted in the 2008 Minister's Report (see Section 1.3.1 below) and by having regard to the findings and recommendations emanating from the other external review processes that recently have been, or currently are being, conducted. These review processes vary in terms of the breadth of the issues they have examined. The Authority considers it worthwhile in this section to introduce those reviews which have a broader scope that overlaps with the issues considered in this Minister's Report. The most relevant of these are:

- the IMO's proposed Market Rules Evolution Plan (see Section 1.3.2);
- the findings and recommendations in the Oates Report (see Section 1.3.3); and
- the findings and recommendations in the AEMC Climate Change Report (see Section 1.3.5); and
- the findings and recommendations in the ESAA Study (see Section 1.3.6).

In addition, there are several other reviews or regulatory processes with a narrower focus. These include:

- the Renewable Energy Generation Working Group (**REGWG**);

[11] ERA, *Annual Wholesale Electricity Market Report to the Minister for Energy,* http://www.era.wa.gov.au/2/532/42/annual_wholesal.pm

[12] Deloitte and Oakley Greenwood, *Verve Energy Review*, August 2009.

[13] AEMC, *Review of Energy Market Frameworks in light of Climate Change Policies*, Final Report, 30 September 2009.

- the Office of Energy's Electricity Retail Market Review, January 2009;
- the Gas Supply and Emergency Management Committee; and
- Western Power Network's review of the Application and Queuing Policy (**AQP**).

These reviews are discussed later in this report where relevant to the topic under consideration.

1.3.1 Recommendations of the 2008 Minister's Report

In the 2008 Minister's Report, the Authority categorised its assessment of the WEM under the following headings:

- observations and recommendations arising from current market outcomes – such as the magnitude of new generation investment in the market and the need to improve the process for new network connection offers;
- recommendations regarding longer term market design issues – such as the approach to network planning and competitive Balancing; and
- broader structural and regulatory issues – such as the lack of cost-reflectivity of retail tariffs, the progress on full retail contestability (**FRC**), market structure concerns and the risks flowing from climate change policies.

In light of the fundamental policy nature of the second and third categories of issues, the Authority recommended the establishment of a 'road map' process to lay out a strategy for the future development of the WEM, so as to ensure that the Wholesale Market Objectives can be more effectively met over time. The Authority suggested that the Office of Energy was the appropriate institution to drive the direction, shape and timing of the road map, but that other stakeholders including participants, the IMO and the Authority could provide valuable input.

1.3.2 Market Rules Evolution Plan

Subsequent to the publication of the 2008 Minister's Report, the IMO published a three-year Market Rules Evolution Plan. The IMO commented that the development of the Market Rules Evolution Plan represents a shift in its focus from refining the Market Rules and ensuring that they work as intended, to shaping the future development of the market.[14] In this context, the IMO has indicated that the Market Rules Evolution Plan is intended to complement the Office of Energy's road map process and that the IMO will continue to work with the Office of Energy to develop the road map.

The IMO presented the original Market Rules Evolution Plan to the Market Advisory Committee (**MAC**) during 2008. The IMO has noted that an updated Market Rules Evolution Plan will be published every six months to incorporate updates to the market reviews, changes in priorities and work completed during the preceding six months.

The Market Rules Evolution Plan sets out a list of issues to be addressed, in order of priority, as deemed by a ballot of MAC members. The IMO has commented to MAC that there is limited value in looking past the top ranked issues at this time due to resource constraints. In the IMO's Market Rules Evolution Plan Proposed Work Programme October 2009,[15] the five top-ranked issues which are to be addressed are the Balancing

[14] IMO, *Development of Market Rules Evolution Plan*, June 2009.

[15] See IMO web site, *Market Rules Evolution Plan Proposed Work Programme_October 2009*, http://www.imowa.com.au/f173,161017/161017_MREP_Work_Programme.pdf

mechanism, the Reserve Capacity Mechanism (**RCM**), the Short Term Energy Market (**STEM**), alignment of gas and electricity nominations and markets in Ancillary Services. The IMO is to provide a scoping document to set out the specific elements to be addressed in the top five issues, and a proposed way forward for the Market Rules Evolution Plan.

While the Authority supports the work of the IMO in the Market Rules Evolution Plan, the Authority considers that there are a broader range of issues that need to be addressed and that these call for an engagement between the IMO and the Office of Energy.

The Verve Review Implementation Coordination Committee has a Market Rules Working Group that proposes changes to the Market Rules where there are perceived financial biases against Verve Energy. Many of the envisaged rule changes are also identified as matters for consideration in the Market Rules Evolution Plan.

1.3.3 Oates Report

The Oates Report was commissioned by the Minister for Energy early in 2009 to investigate the causes of Verve Energy's current financial position and performance, and to present options that might improve Verve Energy's financial outlook.[16] The report was made available on the Office of Energy's web site on 9 September 2009.

The Oates Report made a number of key findings and a range of recommendations regarding various market design and broader industry issues. These are discussed in the body of this Minister's Report.

The Oates Report also canvassed options for structural reform of Verve Energy and Synergy, including a merger and the retention of separate entities. The report found advantages and disadvantages in both forms of organisation, but concluded that the retention of separate entities, combined with measures to expand retail competition while supporting the evolution of wholesale competition, should facilitate an ongoing reduction in the State's exposure to the market, as well as ensuring sufficient generation capacity is provided as necessary.[17]

In response to the Oates Report, the Minister for Energy announced on 26 August 2009 that the Government would not remerge Verve Energy and Synergy.[18]

A significant recommendation in the Oates Report is the need for unified policy and strategy guidance in the implementation of the various recommendations. The Authority considers that this recognition of the need for unified policy and strategy guidance is consistent with the Authority's view expressed in its 2008 Minister's Report.

The Authority also agrees with the Oates Report's finding that there are a number of changes required to the design of the WEM that would better support future reliability, efficiency and competition.[19] In particular, as discussed in Section 4.8, the Authority considers that there is an urgent and growing need to progress work on examining the relative merits of various changes to existing Balancing arrangements, including, but not limited to, competitive Balancing and recommends that consideration of the case for a

[16] Oates Report, p.4.

[17] Oates Report, p.48.

[18] See the Minister for Energy's press release, http://www.mediastatements.wa.gov.au/Pages/WACabinetMinistersSearch.aspx?ItemId=132400&minister=Collier&admin=Barnett

[19] Oates Report, p.6.

move to competitive Balancing should be coordinated with oversight from the Office of Energy as the key policy-making body.

1.3.3.1 Impact of the Market Rules on Verve Energy's financial performance

The Oates Report highlights the fact that Verve Energy has suffered significant financial losses over the period between 2006 and 2009. The Oates Report suggests a number of causes for these financial losses, including plant reliability issues, the impact of the Varanus Island incident, higher network access charges (which are passed through to Verve Energy under the Vesting Contract), anomalies in the terms of the Vesting Contract and the Market Rules, a shortfall in the expected gas trading margin and increased interest costs relating to increased debt.[20]

In a subsequent presentation from the authors of the Oates Report to the Authority, it was reiterated that the Market Rules have contributed to Verve Energy's poor financial performance. In particular, the Oates Report notes that under the Market Rules, Verve Energy is responsible for providing Balancing and Ancillary Services to the market and may be required to do so on non-commercial terms.[21]

The Authority considers it is worth emphasising that the current design of the market is only one and potentially minor factor affecting Verve Energy's financial performance. In the Authority's view, the key factor impacting the financial performance of Verve Energy is the lack of cost-reflectivity in regulated retail tariffs in Western Australia. Financial losses at some point in a supply chain are inevitable in any market in which prices to end users are not sufficient to cover the costs of supplying those end users. As a result of the net-back arrangements under the Vesting Contract, the financial impact of regulated tariffs that are below cost reflective levels is incurred by Verve Energy. Changes to the Vesting Contract could re-assign this financial impact, or part of this financial impact, to Synergy, but would not change the fact that financial losses will be incurred at some point along the supply chain.

The analysis of Verve Energy's financial performance that is set out in the Oates Report does not attempt to quantify the impact of the requirement to provide Balancing and ancillary services on Verve Energy's performance.[22] The Authority considers that the impact of the requirement to provide Balancing and ancillary services to the market is likely to be small compared to some of the other factors that affect Verve Energy's financial performance.

However, analysis set out in the Oates Report does suggest that the combined impact of announced increases in retail tariffs and the payment of a subsidy to cover the remaining shortfall between retail tariffs and cost-reflective tariffs would be sufficient to turn a substantial financial loss to Verve Energy into a profit.[23] In other words, addressing the fact that retail tariffs to end users are not cost-reflective would go a long way to rectifying the financial underperformance of Verve Energy.

It should also be noted that a market does not guarantee that all participants will be profitable. Verve Energy making losses could therefore not be taken as evidence that the market is not working.

[20] Oates Report, p.29.
[21] Oates Report, p.29.
[22] Oates Report, p.29.
[23] Oates Report, p.30.

1.3.4 Strategic Energy Initiative

The State Government is developing a Strategic Energy Initiative (**SEI**) for the development of the energy sector to 2030. The SEI aims to deliver:

- an energy vision for 2030, including a range of demand scenarios and potential supply options;
- a set of clear goals to guide decisions by policy makers and investors;
- a range of flexible strategies to allow industry and the community to adapt to emerging opportunities and challenges; and
- policy and regulatory frameworks to promote investment and competitiveness in the energy value chain and remove impediments to technological change.

The SEI will cover the entire energy supply chain, focusing on the stationary energy sector. The SEI Issues Paper released by the Office of Energy requested comment on a number of issues central to this Minister's Report, including in regard to specific reforms to the WEM, the structure and ownership of Verve Energy, Synergy and Western Power, the introduction of FRC and electricity tariff regulation.

The Office of Energy released the SEI Issues Paper in December 2009. The SEI review will be undertaken over 2010, with the release of the final SEI report towards the end of 2010.

1.3.5 AEMC Climate Change Report

The AEMC has completed its Review of Energy Market Frameworks in Light of Climate Change Policies at the request of the Ministerial Council on Energy (**MCE**). The AEMC considered whether the existing market frameworks in Australia – the rules and regulations governing market behaviour – will continue to deliver efficiency objectives following the commencement of the Carbon Pollution Reduction Scheme (**CPRS**) and expanded Renewable Energy Target (**RET**). Key areas of focus of the AEMC Climate Change Report included network connection and investment, system operation, retail tariff regulation and reliability. The AEMC made a number of observations and recommendations on these topics in its recent Final Report to the MCE, dated 30 September 2009. The Final Report also makes specific comments on the impacts of climate change policies on the WEM. The AEMC's comments and recommendations are discussed in the body of this report.

1.3.6 ESAA Western Australian Energy Market Study

Since the release of the Oates Report and the announcement by the Western Australian Government of the development of a Strategic Energy Initiative, the ESAA, in consultation with its members with interests in Western Australia, has undertaken a Western Australian Energy Market Study.[24] The ESAA Study is intended by the ESAA to contribute to the Western Australian Government's ongoing energy market reforms and to the development of a Strategic Energy Initiative.

The ESAA Study was publicly released late in the process for preparing this Minister's Report. For this reason, this Minister's Report does not explicitly highlight or respond to the issues raised in the ESAA Study. However, the Authority has reviewed the ESAA

[24] ESAA, *Western Australian Energy Market Study: A Pathway to an Efficient Energy Market in Western Australia*, November 2009.

Study and considers that the key issues relating to the WEM that are raised in the ESAA Study have been considered and addressed by the Authority in this Minister's Report.

1.4 Authority's view of the way forward

The Authority considers that the reports and initiatives discussed in Section 1.3 have contributed to the debate around key issues affecting the WEM, and that the IMO's Market Rules Evolution Plan provides a useful framework to progress many of the issues identified by the Authority in its 2008 Minister's Report. However, the Authority notes that there is a continuing lack of clear and coordinated policy approach on a range of key market design, regulatory and structural issues. The Authority is concerned that with multiple reviews and processes currently underway, there is a potential for confusion among stakeholders as to the policy direction on key issues.

The Authority reiterates its view from its 2008 Minister's Report that there needs to be a process put in place for laying out a strategy for the future development of the WEM (**WEM Future Strategy**), which further promotes the Wholesale Market Objectives.[25] The Authority is strongly of the view that this WEM Future Strategy should be based on a transparent and consultative process, and be coordinated by the Office of Energy, so that the consideration of any changes (consistent with the Wholesale Market Objectives) is at 'arm's length' from the perspective of State Government. Where matters are of sufficient importance to warrant Government decisions, these decisions should be based on recommendations developed through the WEM Future Strategy. In the Authority's view, the WEM Future Strategy should address a number of key policy issues that cannot be effectively addressed within the existing market mechanisms, but which have a significant impact on the extent to which the WEM will promote the Wholesale Market Objectives. These include:

- the appropriateness of the continued use of an 'unconstrained' approach to network planning and connections; and
- options for restructuring existing institutional arrangements in the electricity generation and retail sectors.

In addition, there are a number of ongoing issues that go to the fundamental market design of the WEM and therefore raise issues that go beyond what might reasonably be dealt with through the Rule Change Proposal process. These include consideration of changes to the STEM, the Balancing mechanism and the RCM. The Authority notes that many of these market design issues are proposed to be addressed through the IMO's Market Rules Evolution Plan. While the Authority supports the work of the IMO in the Market Rules Evolution Plan, the Authority recommends that there is appropriate engagement between the IMO and the Office of Energy to ensure that policy input is taken into account in progressing the matters within the Market Rules Evolution Plan, and that work on the Market Rules Evolution Plan reflects the broader energy market policy where interactions occur.

With the Office of Energy commencing work on the SEI, the Authority intends to provide input and otherwise assist in the development of clear and coordinated policy in this important area.

[25] The Authority notes that, on 17 November 2009, the Minister for Energy released and invited comment on a discussion paper on the Strategic Energy Initiative 2030, and that one objective of the initiative is to ensure market and regulatory frameworks are responsive and flexible to meet the objectives of Government, industry and consumers.

Recommendation 1

Section 1.4

The Authority considers that there are a number of market evolution issues that need to be progressed in order to address major challenges facing the Wholesale Electricity Market. With multiple reviews and processes currently underway, the Authority considers that there is potential for uncertainty among stakeholders as to how these issues will be progressed.

The Authority considers that a process is required to lay out a strategy for the future development of the Wholesale Electricity Market (WEM Future Strategy). This process needs to be transparent and consultative, and be coordinated by the Office of Energy, so that the consideration of any changes (consistent with the Wholesale Market Objectives) is at 'arm's length' from the perspective of State Government. Where matters are of sufficient importance to warrant Government decisions, these decisions should be based on recommendations developed through the WEM Future Strategy.

In relation to the Independent Market Operator's Market Rules Evolution Plan, the Authority recommends that there is appropriate engagement between the Independent Market Operator and the Office of Energy to ensure appropriate policy input and to ensure that the Market Rules Evolution Plan is consistent with the WEM Future Strategy.

1.5 Confidentiality

Clause 2.16.15 of the Market Rules requires that, where the Authority provides a report to the Minister in accordance with Clause 2.16.11, the Authority must, after consultation with the Minister, publish a version of the report which has confidential or sensitive information aggregated or removed.

This version of the Minister's Report is the public version. Information that is classed as confidential under Chapter 10 of the Market Rules has been identified by the Authority and has been aggregated or removed. Where information that is required to be included in the Minister's Report has been removed from this public version due to it being classed as confidential, the removal of that confidential information is noted. The Minister has been provided with the confidential version of this report.

1.6 Structure of this report

This Minister's Report is structured as follows:

- Section 2 sets out the requirements for the Minister's Report;
- Section 3 provides a summary of the Market Surveillance Data Catalogue (**MSDC**);
- Section 4 sets out the Authority's assessment of the effectiveness of the WEM, the IMO and System Management; and

- Section 5 sets out the Authority's assessment of the specific events, behaviour and matters that impacted on the effectiveness of the WEM.

REPORTING REQUIREMENTS

2 Requirements for the Minister's Report

The Market Rules require the Authority to provide to the Minister for Energy a report on the effectiveness of the market in meeting the Wholesale Market Objectives, and set out specific requirements for the Authority.

Clause 2.16.11 of the Market Rules sets out a requirement for the Minister's Report to report on the effectiveness of the market in dealing with the matters identified in Clause 2.16.9 and Clause 2.16.10. These matters include Ancillary Services and Balancing Support Contracts, instances of inappropriate and anomalous market behaviour (in relation to bidding in the STEM and Balancing, as well as in the making of Availability Declarations, Ancillary Services Declarations and Fuel Declarations), market design problems or inefficiencies, problems with the structure of the market, the effectiveness of the Rule change process, the effectiveness of the monitoring and compliance regime under the Market Rules and the effectiveness of the IMO and System Management in carrying out their functions.

Clause 2.16.12 of the Market Rules sets out further requirements for the Minister's Report, as follows:

a) a summary of the information and data compiled by the IMO and the Economic Regulation Authority under clause 2.16.1;

b) the Economic Regulation Authority's assessment of the effectiveness of the market, including the effectiveness of the IMO and System Management in carrying out their functions, with discussion of each of:

   i) the Reserve Capacity market;

   ii) the market for Bilateral Contracts for capacity and energy;

   iii) the Short Term Energy Market;

   iv) Balancing;

   v) the dispatch process;

   vi) planning processes; and

   vii) the administration of the market, including the Market Rule change process;

c) an assessment of any specific events, behaviour or matters that impacted on the effectiveness of the market; and

d) any recommended measures to increase the effectiveness of the market in meeting the Wholesale Market Objectives to be considered by the Minister.

The Authority's reporting requirements are addressed in the sections that follow:

- Section 3 provides a summary of the data identified in the MSDC and the analysis of that data undertaken by the IMO (required under Clause 2.16.12(a) of the Market Rules);

- Section 4 sets out the Authority's assessment of the effectiveness of the market, including the effectiveness of the IMO and System Management in carrying out their functions; and
- Section 5 sets out the Authority's assessment of any specific events behaviour or matters that impacted on the effectiveness of the market.

3 Market Surveillance Data Catalogue

Clause 2.16.12(a) of the Market Rules requires that the Minister's Report contains a summary of the information and data compiled by the IMO and the Authority under Clause 2.16.1. Clause 2.16.1 of the Market Rules makes the IMO responsible for collecting and compiling the data identified in the MSDC, analysing the compiled data, and providing both the data and the analysis to the Authority. The data that is to be included in the MSDC is set out in Clause 2.16.2 of the Market Rules, and the analysis of the data that the IMO must undertake is set out in Clause 2.16.4 of the Market Rules.

The required summary of the data items in the MSDC and the analysis of the data undertaken by the IMO are provided in this section, and are structured to follow the data items set out in Clause 2.16.2. In most cases the summary covers the period from market commencement on 21 September 2006 to 31 July 2009.

3.1 Number of Market Generators and Market Customers

Clause 2.16.2(a) of the Market Rules requires that the MSDC identify the number of Market Generators and Market Customers in the WEM.

As at 6 October 2009 the following participants were registered with the IMO:

- 19 entities registered as Market Generators only;
- 9 entities registered as Market Customers only; and
- 8 entities registered as both Market Generators and Market Customers.

This is a total of 36 registered entities and represents an increase from 15 entities at market commencement and 30 entities as at 2 September 2008. Table 1 provides a list of these participants, at market commencement, 2 September 2008 and 6 October 2009.

In addition to these Market Generators and Market Customers, there are other classes of Market Participants. As of 6 October 2009, there were two entities registered as Network Operators: Western Power and Alinta Sales Pty Ltd.

Table 1: Registered Market Participants

	Market commencement (21 September 2006)	2 September 2008	6 October 2009
Market Generators and Market Customers	Alcoa of Australia Ltd Alinta Sales Pty Ltd Landfill Gas and Power Pty Ltd Perth Energy Pty Ltd Southern Cross Energy Verve Energy	Alcoa of Australia Ltd Alinta Sales Pty Ltd Griffin Power Pty Ltd Griffin Power 2 Pty Ltd Landfill Gas and Power Pty Ltd Perth Energy Pty Ltd Southern Cross Energy Verve Energy	Alcoa of Australia Ltd Alinta Sales Pty Ltd Griffin Power Pty Ltd Griffin Power 2 Pty Ltd Landfill Gas and Power Pty Ltd Perth Energy Pty Ltd Southern Cross Energy Verve Energy
Market Generators (only)	EDWF Manager Pty Ltd Goldfields Power Pty Ltd Mount Herron Engineering Pty Ltd Waste Gas Resources Pty Ltd	Bioenergy Limited Coolimba Power Pty Ltd EDWF Manager Pty Ltd Eneabba Gas Limited Eneabba Energy Pty Ltd Goldfields Power Pty Ltd Mount Herron Engineering Pty Ltd Namarkkon Pty Ltd NewGen Power Kwinana Pty Ltd NewGen Neerabup Pty Ltd SkyFarming Pty Ltd Wambo Power Ventures Pty Ltd Waste Gas Resources Pty Ltd Western Australia Biomass Pty Ltd	Bioenergy Limited Collgar Wind Farm Coolimba Power Pty Ltd EDWF Manager Pty Ltd Eneabba Gas Limited Eneabba Energy Pty Ltd Goldfields Power Pty Ltd Mount Herron Engineering Pty Ltd Namarkkon Pty Ltd NewGen Power Kwinana Pty Ltd NewGen Neerabup Pty Ltd NewGen Neerabup Partnership SkyFarming Pty Ltd Tesla Corporation Pty Ltd Vinalco Energy Pty Ltd Wambo Power Ventures Pty Ltd Waste Gas Resources Pty Ltd Western Australia Biomass Pty Ltd Western Energy Pty Ltd
Market Customers (only)	Barrick (Kanowna) Limited Newmont Power Pty Ltd Premier Power Sales Pty Ltd Synergy Water Corporation	Barrick (Kanowna) Limited Clear Energy Pty Ltd Energy Response Pty Ltd Karara Energy Pty Ltd Newmont Power Pty Ltd Premier Power Sales Pty Ltd Synergy Water Corporation	Barrick (Kanowna) Limited Clear Energy Pty Ltd DMT energy Energy Response Pty Ltd Karara Energy Pty Ltd Newmont Power Pty Ltd Premier Power Sales Pty Ltd Synergy Water Corporation

3.2 Number of participants in each Reserve Capacity Auction

Clause 2.16.2(b) of the Market Rules requires that the MSDC identify the number of participants in each Reserve Capacity Auction.[26]

A Reserve Capacity Auction is run by the IMO only if the number of Capacity Credits, assigned to facilities that have indicated their intention to trade their capacity bilaterally, is insufficient to meet the system requirement and there are remaining certified capacities. As yet, there has been no requirement for the IMO to run a Reserve Capacity Auction.

3.3 Prices in each Reserve Capacity Auction and Short Term Energy Market Auction

Clause 2.16.2(c) of the Market Rules requires that the MSDC identify clearing prices in each Reserve Capacity Auction and STEM Auction. Since there has been no requirement for the IMO to run a Reserve Capacity Auction, this Minister's Report deals only with clearing prices in STEM Auctions.

As well as the requirement under clause 2.16.2(c) of the Market Rules that the MSDC identify clearing prices in STEM Auctions, there is also a requirement under clause 2.16.4 to calculate:

- means and standard deviations of clearing prices in STEM Auctions;
- monthly, quarterly and annual moving averages of clearing prices in STEM Auctions;
- statistical analysis of the volatility of prices in STEM Auctions;
- the proportion of time that clearing prices in STEM Auctions are at each price limit;
- the correlation between capacity offered into the STEM Auctions and the incidence of high prices; and
- exploration of key determinants for high prices in the STEM.

This section summarises the results of the requirements under both clause 2.16.2 and clause 2.16.4.

3.3.1 Short Term Energy Market Clearing Prices

STEM Clearing Prices are summarised separately for Peak Trading Intervals (occurring between 8am and 10pm) and Off-Peak Trading Intervals (occurring between 10pm and 8am). There are significant differences between peak and off-peak clearing prices, both in terms of the average level of prices and the volatility of prices. Table 2 sets out the mean and standard deviation of STEM Clearing Prices, for peak and Off-Peak Trading Intervals, over the period from market commencement to 31 July 2009.

[26] The process for determining the Reserve Capacity Price for a Reserve Capacity Cycle and the quantity of Reserve Capacity scheduled for the IMO for each Market Participant under Clause 4.19.

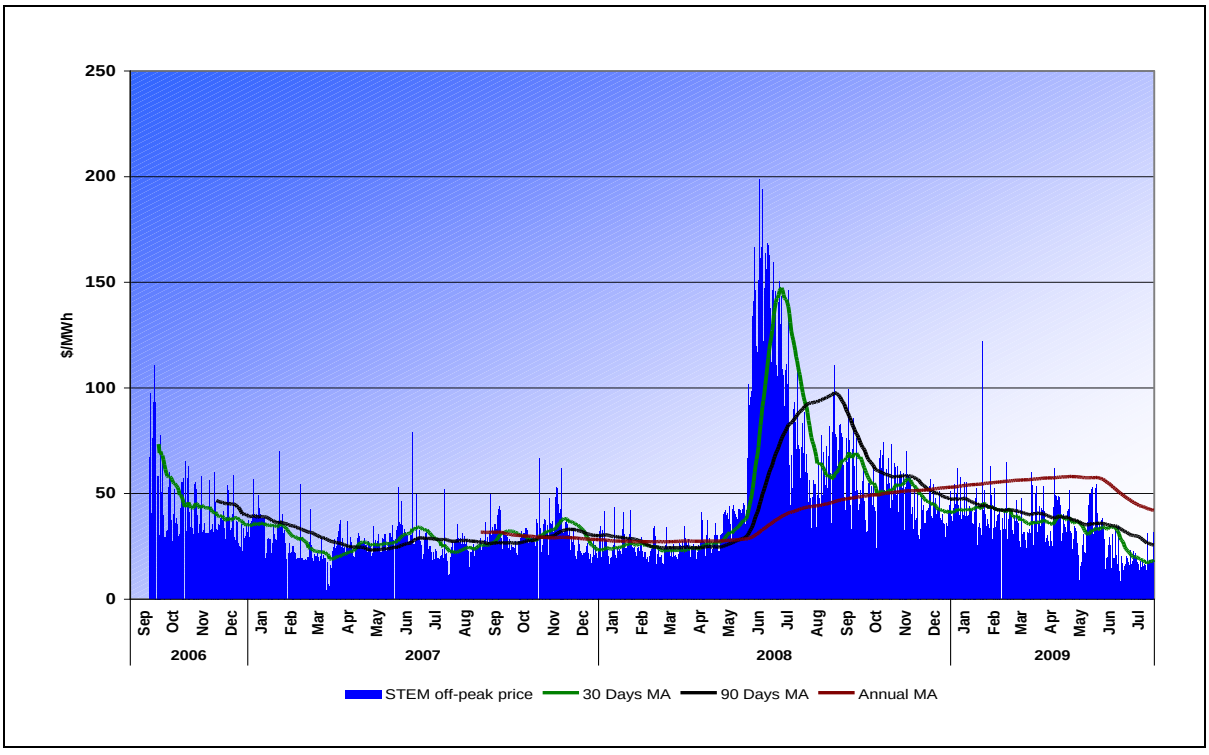
Table 2: Mean and standard deviations of STEM Clearing Prices (21 September 2006 to 31 July 2009)

Trading Interval	Mean ($/MWh)	Standard deviation ($/MWh)
Off-peak	39.42	34.29
Peak	79.13	66.73

Figure 1 and Figure 2 illustrate, respectively, average daily off-peak and peak STEM Clearing Prices for each Trading Day from market commencement up to 31 July 2009, as well as 30-day, 90-day and annual moving average prices.

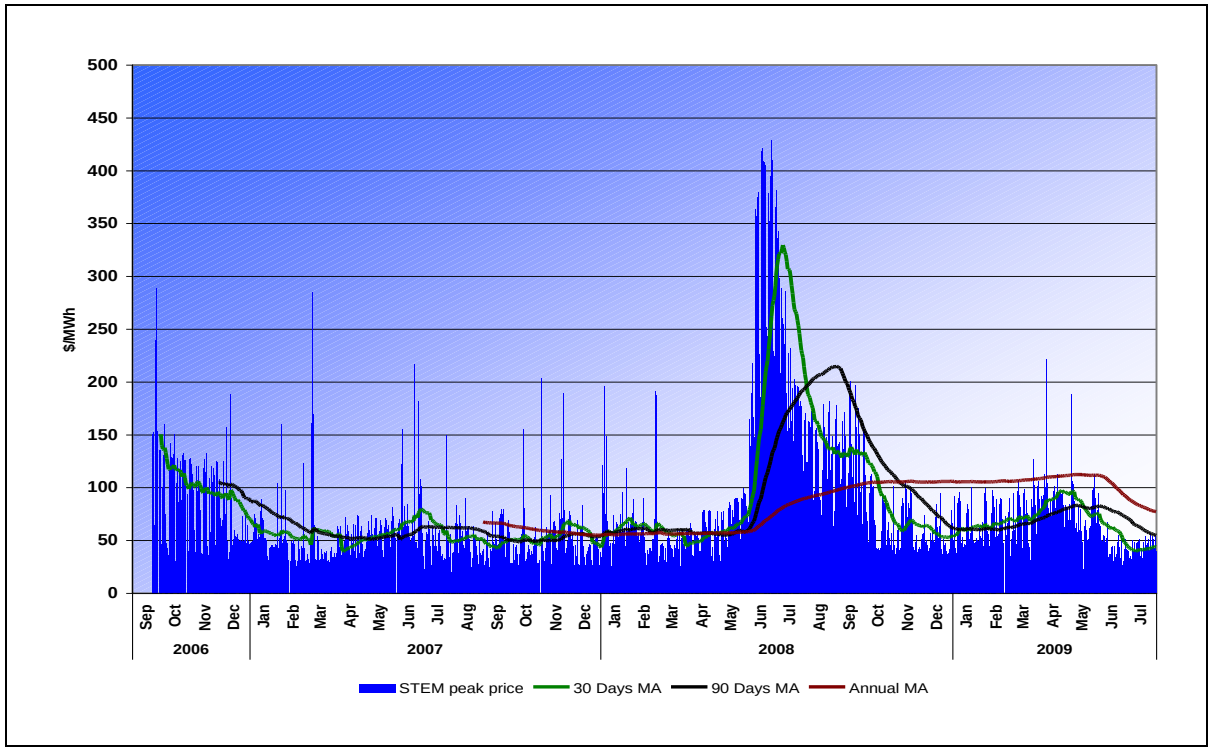
As can be seen from the average daily prices, and more clearly from the 30-day moving average price, both peak and off-peak STEM Clearing Prices have gradually fallen after the Varanus Island incident in June 2008. Both peak and off-peak prices are now below levels seen prior to that event and in average terms are equivalent to their lowest levels since the market commenced. One factor affecting STEM Clearing Prices during the 2008/09 Capacity Year[27] is the additional capacity brought about by the introduction of new Griffin Power and NewGen power stations.

Figure 1: Average daily off-peak STEM Clearing Prices



[27] A Capacity Year is a period of 12 months commencing at the start of the Trading Day which commences on 1 October and ending on the end of the Trading Day ending on 1 October of the following calendar year.

Figure 2: Average daily peak STEM Clearing Prices



3.3.2 Volatility of Short Term Energy Market Clearing Prices

Figure 1 and Figure 2 also indicate that the volatility of both peak and off-peak prices have diminished from May 2009.

The Market Rules require the Authority to publish statistical analysis of the volatility of prices in STEM Auctions. Figure 3 shows the means and standard deviations (as well as maxima and minima) by month of STEM Clearing Prices for Off-Peak Trading Intervals from market commencement up to 31 July 2009. Figure 4 shows the same for Peak Trading Intervals. These figures show that volatility in both off-peak and peak prices increased substantially post-May 2008, following the Varanus Island incident, but this volatility has subsequently diminished. STEM Clearing Prices are now broadly as stable as at any stage since market commencement.

Figure 3: Summary statistics for STEM Clearing Prices in Off-Peak Trading Intervals, by month

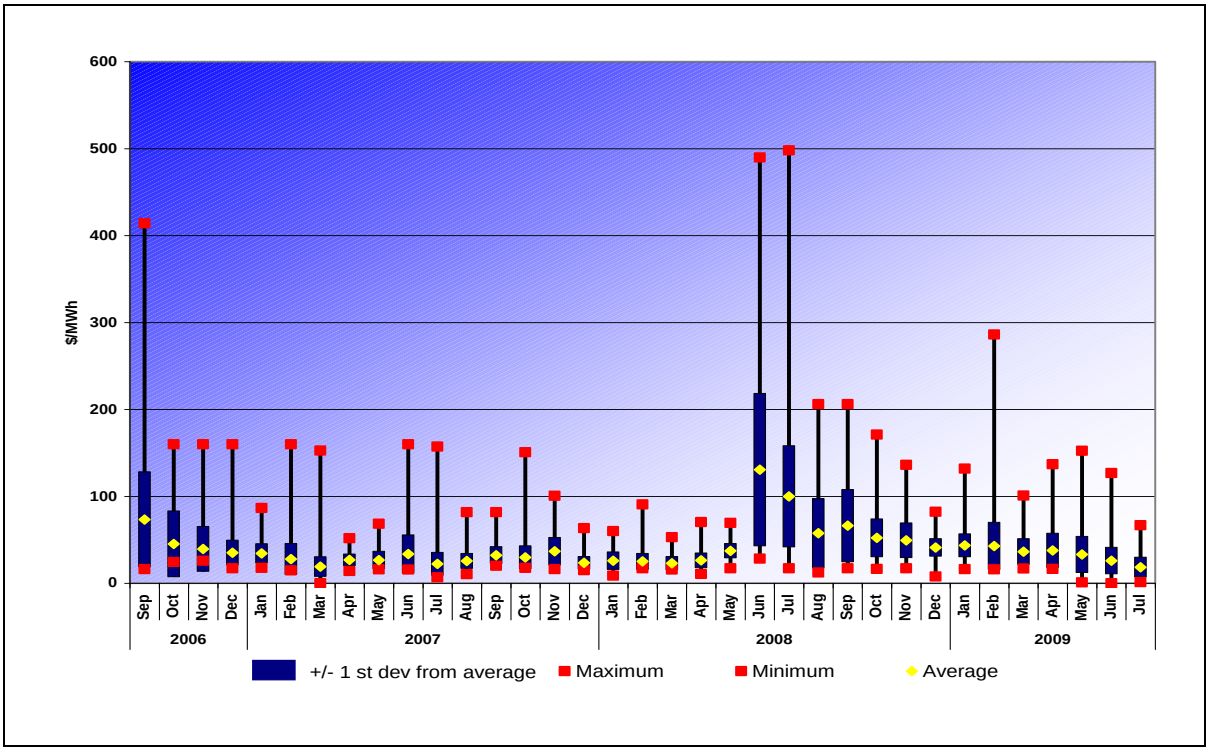
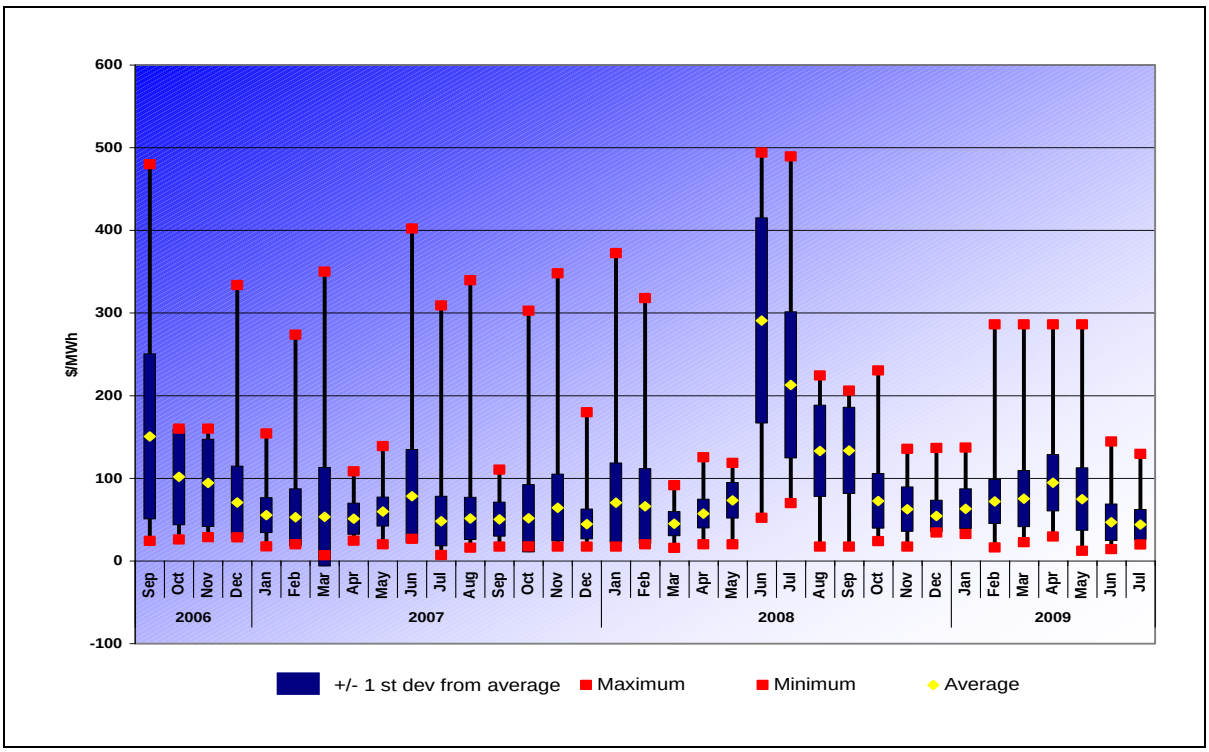


Figure 4: Summary statistics for STEM Clearing Prices in Peak Trading Intervals, by month



3.3.3 High prices in the Short Term Energy Market

Clause 2.16.4 of the Market Rules requires an examination of both the incidence and the causes of high prices in the STEM.

One way of examining the incidence of high prices is to assess the proportion of time that STEM Clearing Prices are at the Energy Price Limits. There are two Energy Price Limits set out in the Market Rules that act as a cap on high prices.

- Generation Capacity not running on Liquid Fuel must not be priced above the Maximum STEM Price. The Maximum STEM Price is based on the cost of an open cycle gas turbine. The Market Rules specify that the Maximum STEM Price is adjusted annually subject to review by the IMO. For the period from 1 October 2008 to 1 October 2009 the Maximum STEM Price was $286/MWh.
- Generation Capacity running on Liquid Fuel must not be priced above the Alternative Maximum STEM Price. The Alternative Maximum STEM Price is based on the cost of a Liquid Fuel facility. The Market Rules specify that the Alternative Maximum STEM Price is adjusted monthly to reflect changes in oil prices and the consumer price index, and is subject to review by the IMO. Since market commencement, the Alternative Maximum STEM Price has been as low as $380/MWh and as high as $779/MWh.

Figure 5 illustrates the proportion of Peak Trading Intervals and Off-Peak Trading Intervals during which STEM Clearing Prices were at the Maximum STEM Price. This figure shows that since 2007, the highest incidence of both off-peak and peak prices reaching the Maximum STEM Price occurred in June and July 2008. However, since then, the frequency of the Maximum STEM Price being reached has greatly diminished for peak prices and virtually disappeared for off-peak prices.

Figure 5: Proportion of Trading Intervals STEM Clearing Prices at Maximum STEM Price, by month

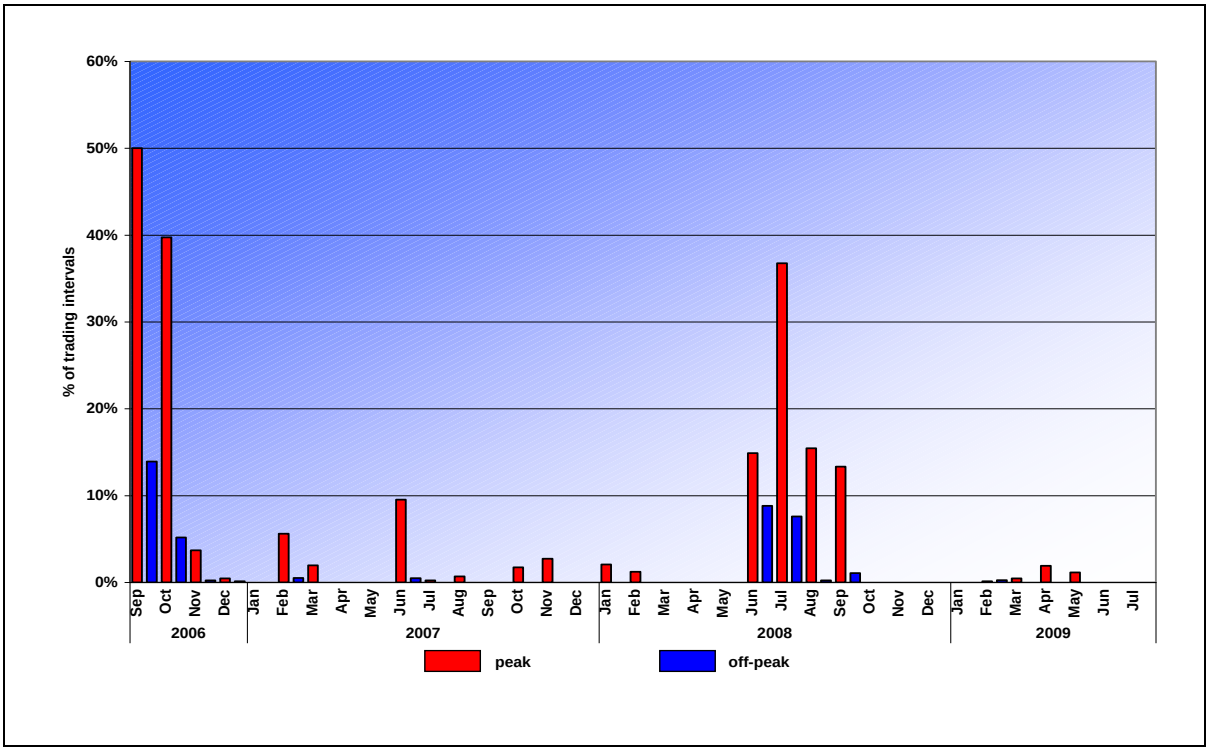
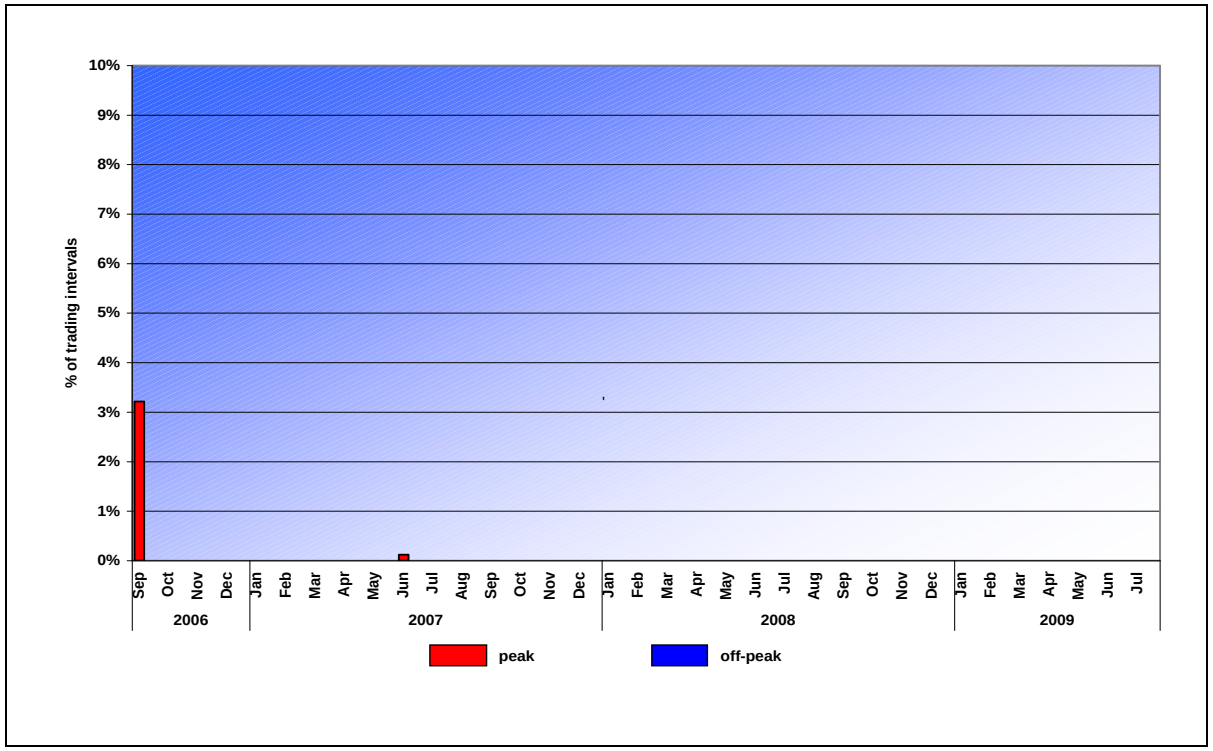


Figure 6 illustrates the proportion of Peak Trading Intervals and Off-Peak Trading Intervals during which STEM Clearing Prices were at the Alternative Maximum STEM Price. As can be seen, STEM Clearing Prices have only ever consistently reached the Alternative Maximum STEM Price during Peak Trading Intervals in September 2006.

Figure 6: Proportion of Trading Intervals STEM Clearing Prices at Alternative Maximum STEM Price, by month



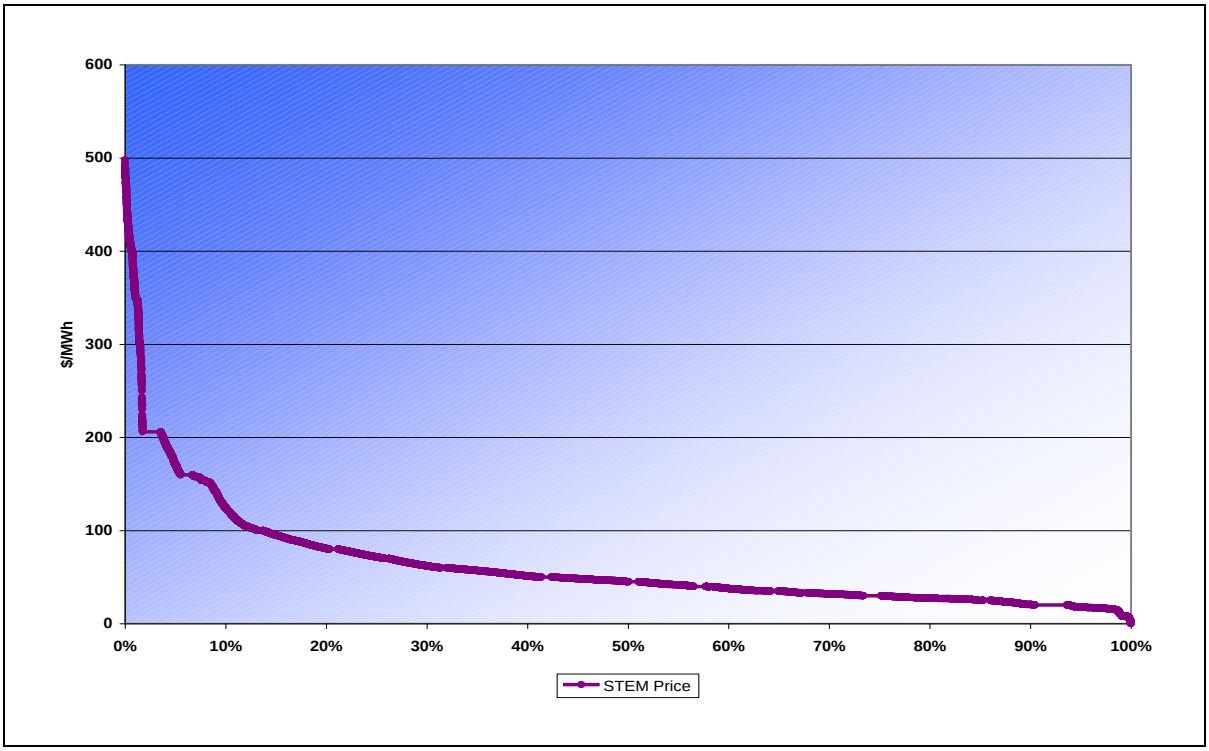
Another way of examining the incidence of high prices is to plot a price duration curve. Figure 7 sets out the price duration curve for STEM Clearing Prices, covering all Trading Intervals since market commencement to 31 July 2009.[28]

As can be seen in Figure 7, the majority of STEM Clearing Prices occur in a broad range below $100/MWh: prices fall between $0/MWh and $100/MWh for approximately 86 per cent of total Trading Intervals, with a fairly even distribution of prices within this range. When prices do exceed $100/MWh, they tend to reach or approach the relevant Maximum STEM Price.[29]

[28] Price duration curves for off-peak and peak periods are set out in Figure 29 and Figure 30, respectively, in Appendix 3.

[29] The Maximum STEM Price was $153.73/MWh from 21 September 2006 to 1 October 2006, $159.84/MWh from 1 October 2006 to 1 October 2007, $163.15 from 1 October 2007 to 1 November 2007, $206/MWh from 1 November 2007 to 1 October 2008 and $286/MWh from 1 October 2008 to 1 October 2009.

Figure 7: Price duration curve for STEM Clearing Prices (21 September 2006 to 31 July 2009)



Clause 2.16.4(e) of the Market Rules requires the IMO to calculate the correlation between capacity offered into STEM Auctions and the incidence of high prices. The 2007 Minister's Report discussed two ways in which this requirement could be interpreted, and how the two factors were related.[30] The 2007 Minister's Report also provided information on correlations between STEM Clearing Prices and quantities offered. However, the 2007 Minister's Report highlighted that a simple correlation between capacity and prices will fail to capture other factors that can influence STEM Clearing Prices, such as bidding behaviour and demand conditions. It commented that more detailed analysis was required to understand the key determinants of high prices in the STEM. For these reasons, correlations between STEM Clearing Prices and quantities offered are not included in this report. However, the Authority notes that a joint ERA-IMO working group has been formed to develop a more appropriate approach to this analysis. More details regarding this process are provided in section 3.19 below.

Clause 2.16.4(g) requires the IMO to explore the key determinants for high prices in the STEM and Balancing. This matter is being considered by the joint ERA-IMO working group referred to above and discussed in section 3.19 below.

3.4 Balancing prices

Clause 2.16.2(d) of the Market Rules requires that the MSDC identify Balancing Data prices and other Standing Data prices used in Balancing.

There is also a requirement under clause 2.16.4 to calculate:

[30] Economic Regulation Authority, *Annual Wholesale Electricity Market Report for the Minister for Energy*, 21 December 2007, pp.18-20.

- means and standard deviations of Balancing Data prices;
- monthly, quarterly and annual moving averages of Balancing Data prices;
- statistical analysis of the volatility of Balancing Data prices;
- the proportion of time that Balancing Data prices are at each price limit;
- the correlation between capacity available for Balancing and the incidence of high prices; and
- exploration of key determinants for high Balancing prices.

This section summarises the results of the requirements under both clause 2.16.2 and clause 2.16.4.

3.4.1 Balancing prices

Balancing enables Market Participants to adjust their Net Contract Position so that supply equals demand in real-time. Generally, System Management will match supply and demand in the system using Verve Energy's facilities. However, there are circumstances in which System Management can issue Dispatch Instructions to other Market Participants.

3.4.1.1 Standing Data prices used in Balancing

Where Market Participants other than Verve Energy are issued Dispatch Instructions by System Management, these deviations are settled on a pay-as-bid basis. The Standing Data prices used in Balancing consist of prices bid to increase or decrease supply by Market Participants other than Verve Energy.

The Standing Data prices used in Balancing are summarised in Figure 31 through to Figure 35 in Appendix 3, for the period from market commencement to 31 July 2009. These figures present average daily prices bid to increase and decrease consumption, by type of facility: non-liquid generation, liquid generation, intermittent generation and Curtailable Loads.[31]

Broadly, independent power producers want to be paid close to the applicable maximum STEM prices when instructed to increase generation from their Scheduled Generators irrespective of the time of the day. When instructed to 'back off' generation, independent power producers also want to be paid if a Non-Liquid generator is backed off, but are willing to pay a low price (relative to distillate generation cost) for generation backed off from a Liquid Scheduled Generator.

In discussions with the Authority, the IMO has explained why some Market Participants have high prices to increase supply. Market Participants tend not to arrange fuel supply and fuel transport to be able to increase supply at short notice, because Market Participants are unlikely to be called upon to increase supply on a regular basis. It will thus be expensive to provide additional generation, as required by System Management. To some extent the fuel supply inflexibilities apply to 'decrease supply' prices as well. For example, a generator could normally absorb a lower gas take under its take-or-pay gas contract without any significant financial impact. However, if the generator is already averaging below its take-or-pay level, or is close to going below, it will be reluctant to cut back generation. Its decrease supply pay-as-bid prices will be negative (that is, be paid

[31] Curtailable Loads is a metered point through which electricity is consumed, where consumption can be curtailed at short notice.

when reducing generation) and in the extreme case moving towards the Minimum STEM Price or limited at the Minimum STEM Price. This may not apply to wind generators as they have no fuel contracts – the only relevant cost element for wind generators is a Renewable Energy Certificates revenue loss when generation is reduced.

The independent power producers' wind generators are however paid a Standing Data price in excess of $100 per MWh to be backed off (see Figure 33 and Figure 34 in Appendix 3). The level at which the Standing Data price is set will have important implications as more intermittent generation enters the market, and there is an increased need for intermittent generation to be curtailed, for example, overnight in order to keep on a thermal plant needed for next day generation. This point is raised by System Management in its submission.

3.4.1.2 MCAP, UDAP and DDAP

In addition to Standing Data Balancing prices, there are three other Balancing prices determined by the IMO, being the:

- Marginal Cost Administered Price (**MCAP**);
- Upwards Deviation Administered Price (**UDAP**); and
- Downwards Deviation Administered Price (**DDAP**).

MCAP is used to settle deviations from Net Contract Position[32] by Verve Energy, by Non-Scheduled Generators, by Non-Dispatchable, Interruptible and Curtailable Loads, and by non-Verve Energy Scheduled Generators.[33] In other words, rather than paying or receiving pay-as-bid prices for deviations, these facilities pay or receive MCAP for these deviations.

UDAP and DDAP are used to settle deviations outside a tolerance[34] for non-Verve Energy Scheduled Generators (excluding those subject to a test) that deviate from their schedules without instruction from System Management. UDAP is set at a discount to MCAP to discourage upward deviations without instruction from System Management and DDAP is set at a premium to MCAP to discourage downward deviations without instruction from System Management.[35]

As with the analysis of STEM Clearing Prices, Balancing prices are separately summarised for peak and off-peak periods.

Table 3, Table 4 and Table 5 set out the mean and standard deviation of the MCAP, the UDAP and the DDAP, for peak and off-peak periods, over the period from market commencement up to 31 July 2009. The patterns of Balancing prices broadly reflect the pattern of STEM Clearing Prices, with higher and more volatile prices during peak periods. This result is as expected, since the MCAP for a given Trading Interval (and, by extension,

[32] A Market Participant's Net Contract Position is its amount of contracted energy corresponding to its bilateral trades plus its STEM trades. In real-time, the actual energy provided may deviate from this Net Contract Position. The Balancing mechanism provides the means for trading these deviations.

[33] Subject to Commissioning Tests of their Reserve Capacity Requirements as well as within tolerance deviations in the output of these generators.

[34] As provided for under Market Rule clause 6.17.9.

[35] The UDAP and DDAP multiplier values are applied to energy generated (UDAP) and energy purchased (DDAP). The value of the UDAP is zero during off-peak periods and is equal to the MCAP multiplied by 0.5 during peak periods. The value of the DDAP is the MCAP multiplied by 1.1 during off-peak periods and the MCAP multiplied by 1.3 during peak periods.

the UDAP and the DDAP for that Trading Interval) is based on STEM Bids and STEM Offers for that Trading Interval.

Table 3: Mean and standard deviations of the MCAP (21 September 2006 to 31 July 2009)

Trading Interval	Mean ($/MWh)	Standard deviation ($/MWh)
Off-peak	46.23	49.39
Peak	95.87	91.84

Table 4: Mean and standard deviations of the UDAP (21 September 2006 to 31 July 2009)

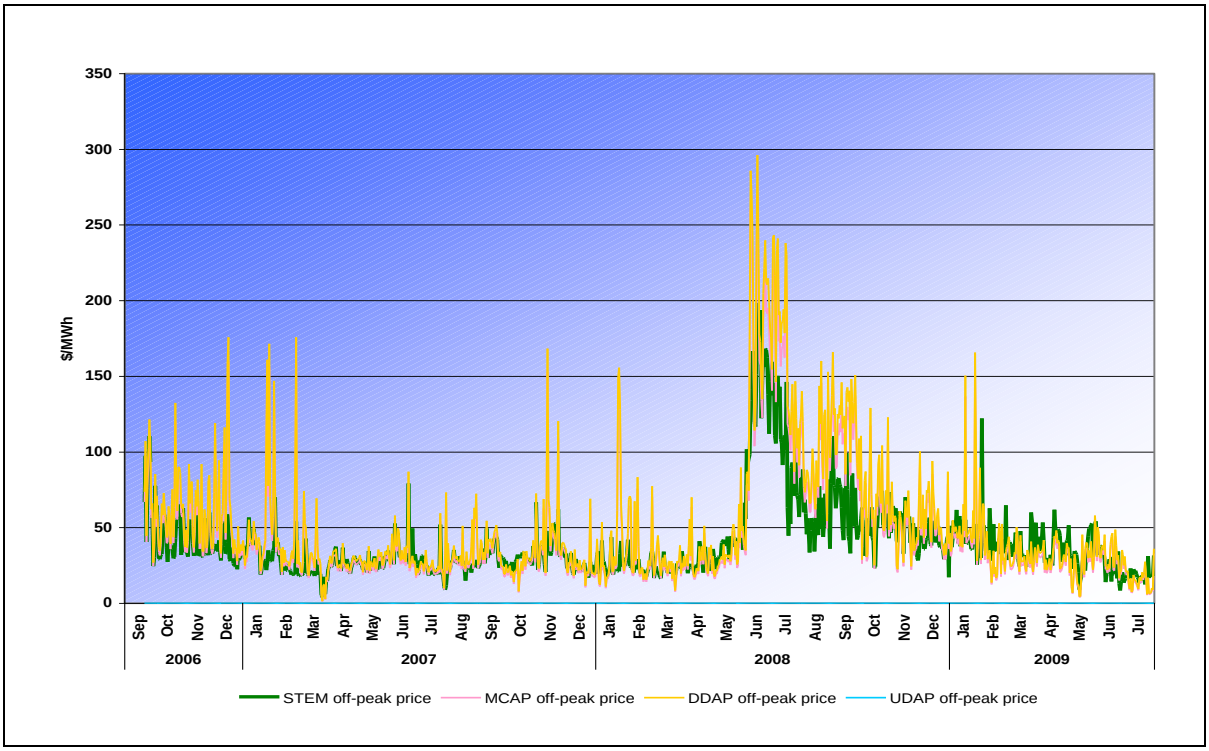
Trading Interval	Mean ($/MWh)	Standard deviation ($/MWh)
Off-peak	0.00	0.00
Peak	47.94	45.92

Table 5: Mean and standard deviations of the DDAP (21 September 2006 to 31 July 2009)

Trading Interval	Mean ($/MWh)	Standard deviation ($/MWh)
Off-peak	50.85	54.33
Peak	123.35	114.22

Figure 8 illustrates average daily off-peak Balancing and STEM Clearing Prices for each Trading Day from market commencement up to 31 July 2009. Because the DDAP is set equal to the MCAP multiplied by 1.1 during off-peak periods, a clear link between the two can be observed in Figure 8. UDAP is set at zero during Off-Peak Trading Intervals, and therefore is not visible in Figure 8.

Figure 8: Average daily off-peak Balancing prices



There is a strong correlation between off-peak Balancing prices and off-peak STEM Clearing Prices. This similarity is shown more clearly in Figure 9 and Figure 10, which compare the 30-day and 90-day moving averages of off-peak STEM and Balancing prices, respectively.

During off-peak periods, both STEM Clearing Prices and Balancing prices increased in mid-2008 due to the Varanus Island incident. These prices subsequently declined and by July 2009 were at their lowest levels since market commencement. Notably, from the start of the gas supply interruption until November 2008, off-peak MCAPs were consistently higher than STEM Clearing Prices. Since March 2009, the situation has reversed but the difference between the two sets of prices has narrowed since mid-2008.

Figure 9: 30-day moving average off-peak STEM and Balancing prices

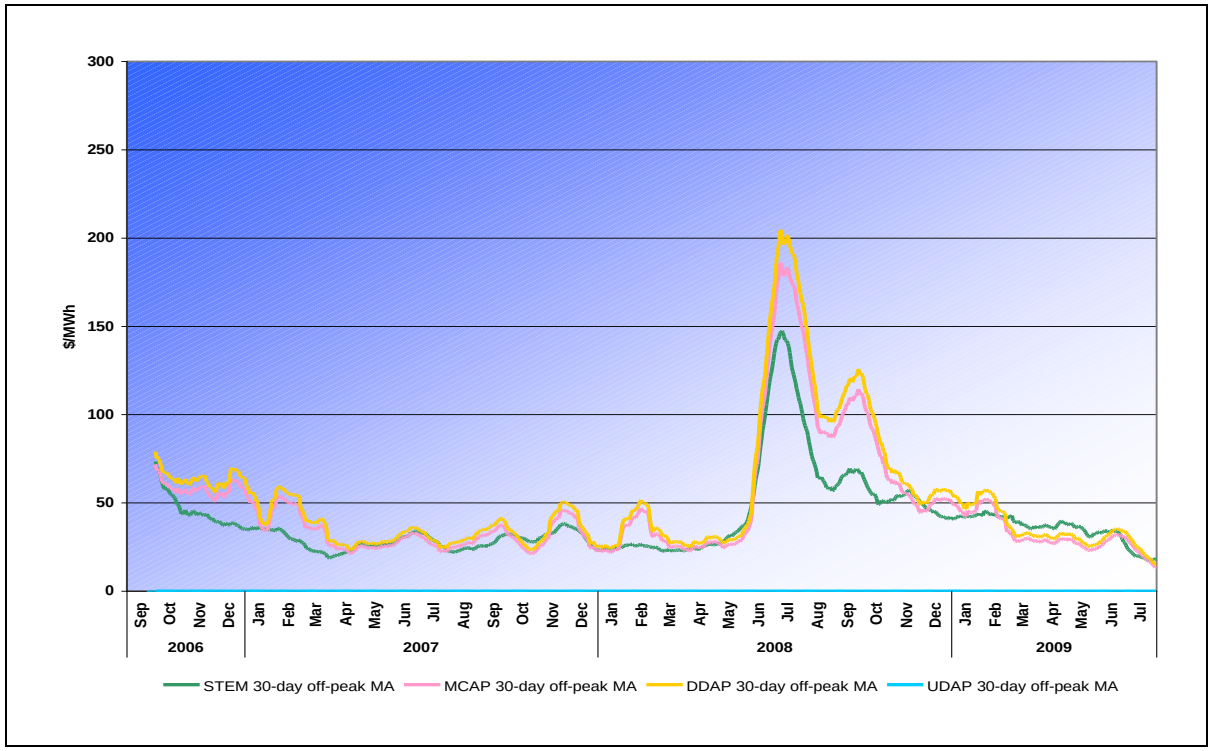


Figure 10: 90-day moving average off-peak STEM and Balancing prices

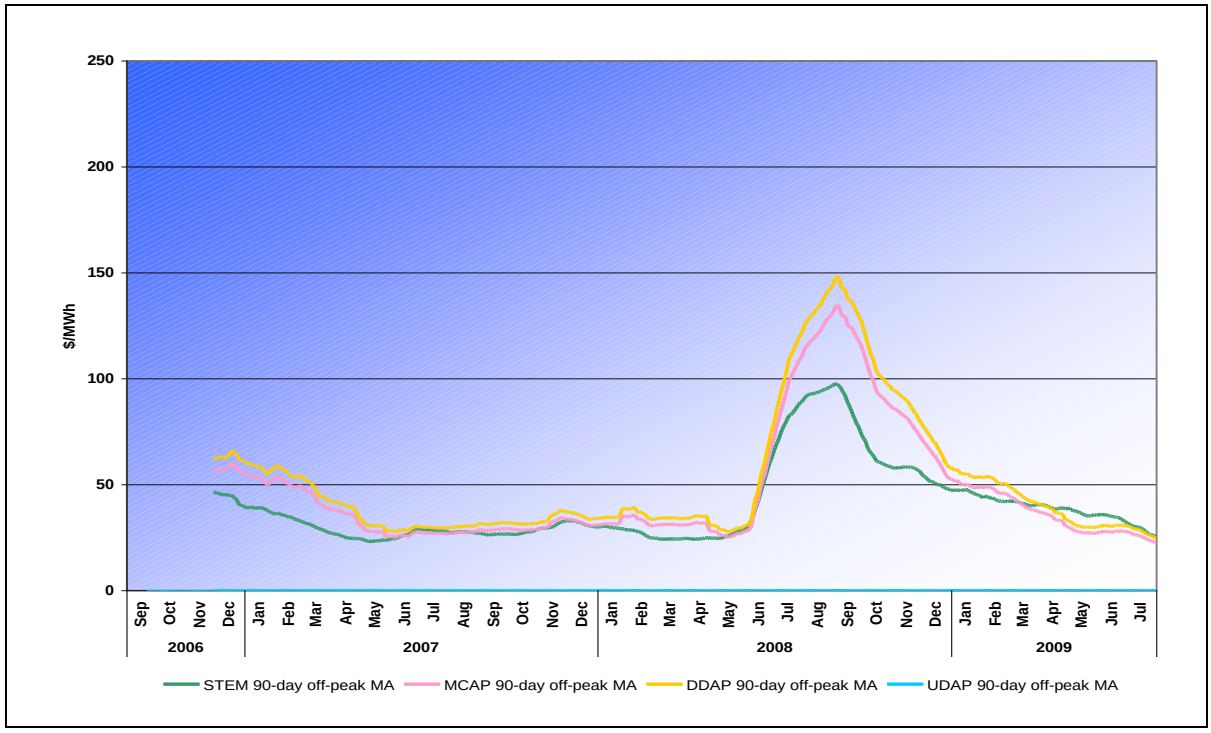
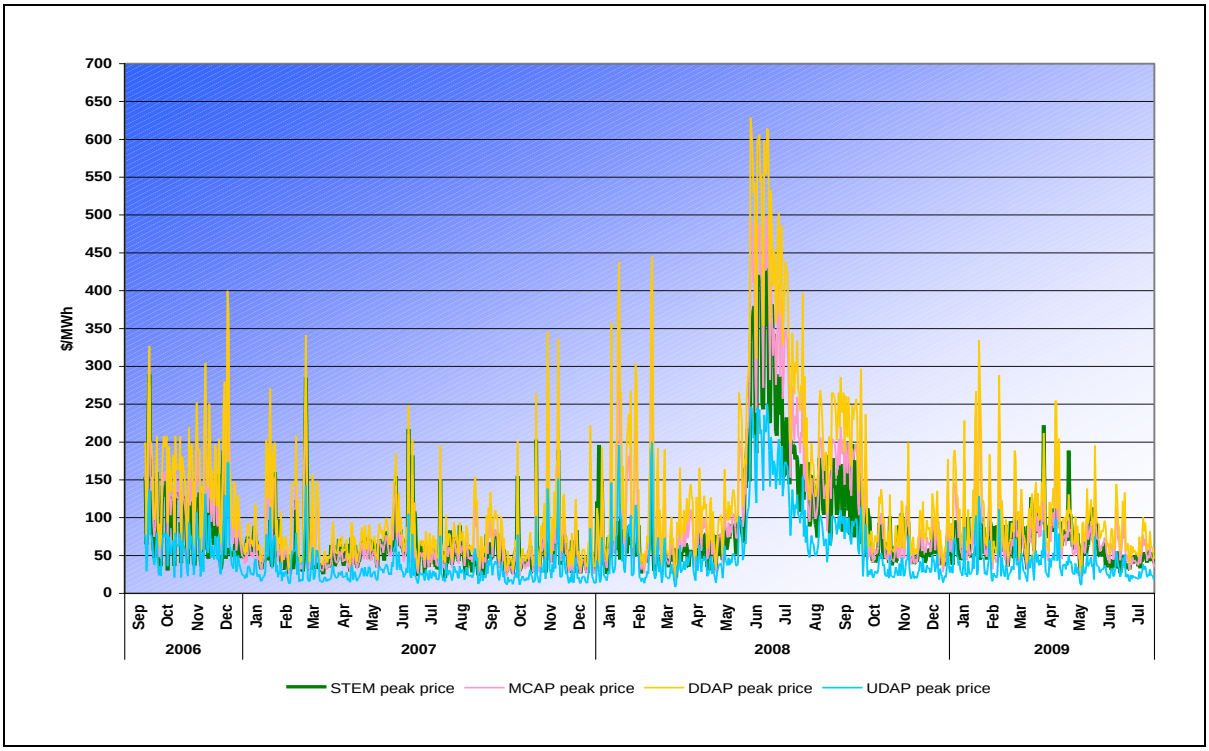


Figure 11 illustrates average daily peak Balancing prices for each Trading Day from market commencement to 31 July 2009. Because the UDAP and the DDAP are set with reference to the MCAP, there is a clear correlation between the three prices.

Figure 11: Average daily peak Balancing prices



As with off-peak periods, the pattern of Balancing prices (i.e. MCAPs, DDAPs and UDAPs) during peak periods is similar to the pattern of peak STEM Clearing Prices. This similarity is shown in Figure 12 and Figure 13, which compare 30-day and 90-day moving averages of peak STEM and Balancing prices, respectively.

Similar to off-peak prices, higher STEM Clearing Prices and Balancing prices during Peak Trading Intervals in mid-2008 resulted from the Varanus Island incident, to then decline to their lowest market level by July 2009 since market commencement. Notably, from the start of 2008, peak MCAPs were consistently higher than STEM Clearing Prices. However, since March/April 2009, peak STEM prices and MCAPs have broadly converged.

Figure 12: 30-day moving average peak STEM and Balancing prices

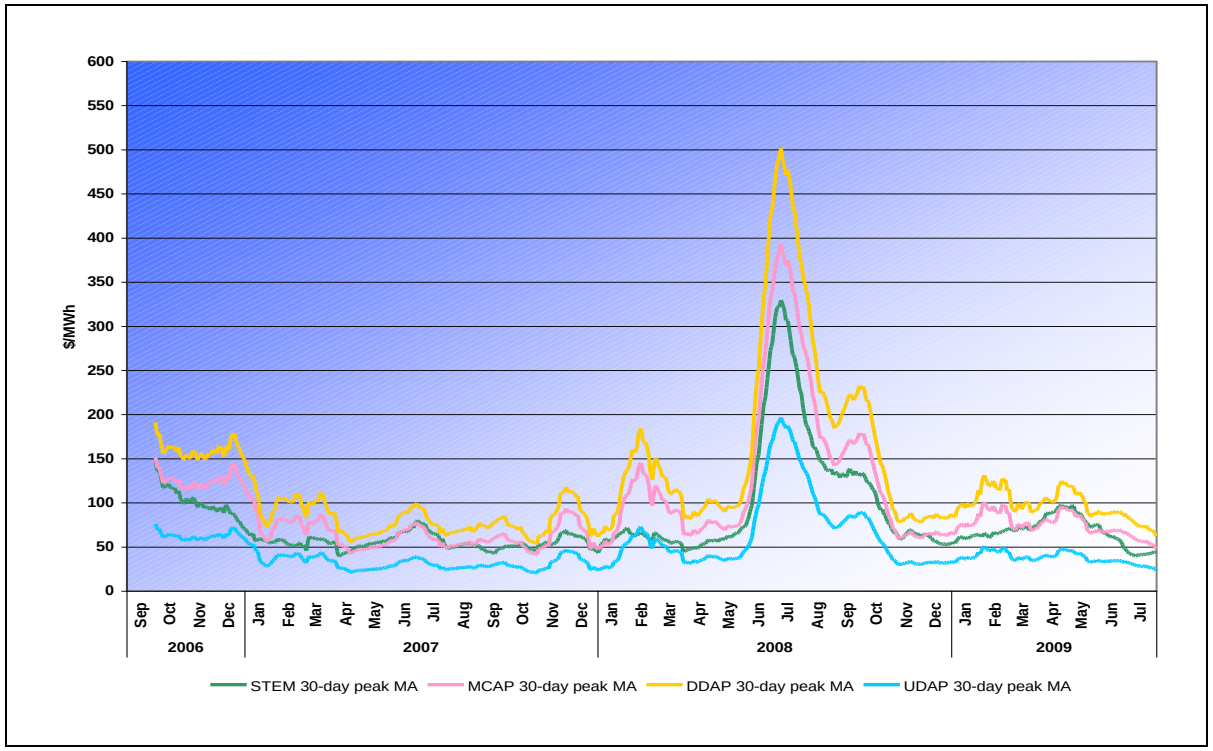


Figure 13: 90-day moving average peak STEM and Balancing prices

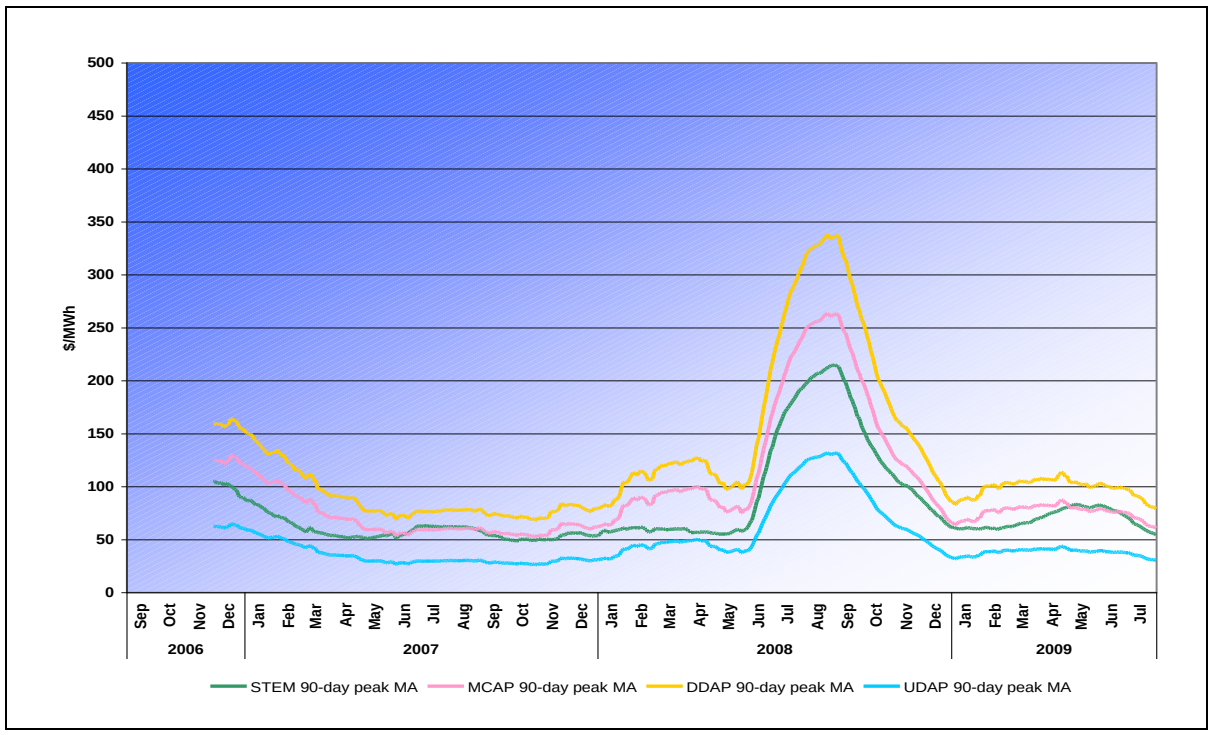


Figure 14 and Figure 15 show annual moving average STEM and Balancing prices for off-peak and peak periods, respectively. These figures show that annual average prices

increased significantly at the time of the Varanus Island incident, but have since fallen to around pre-incident levels.

Figure 14: Annual moving average off-peak STEM and Balancing prices

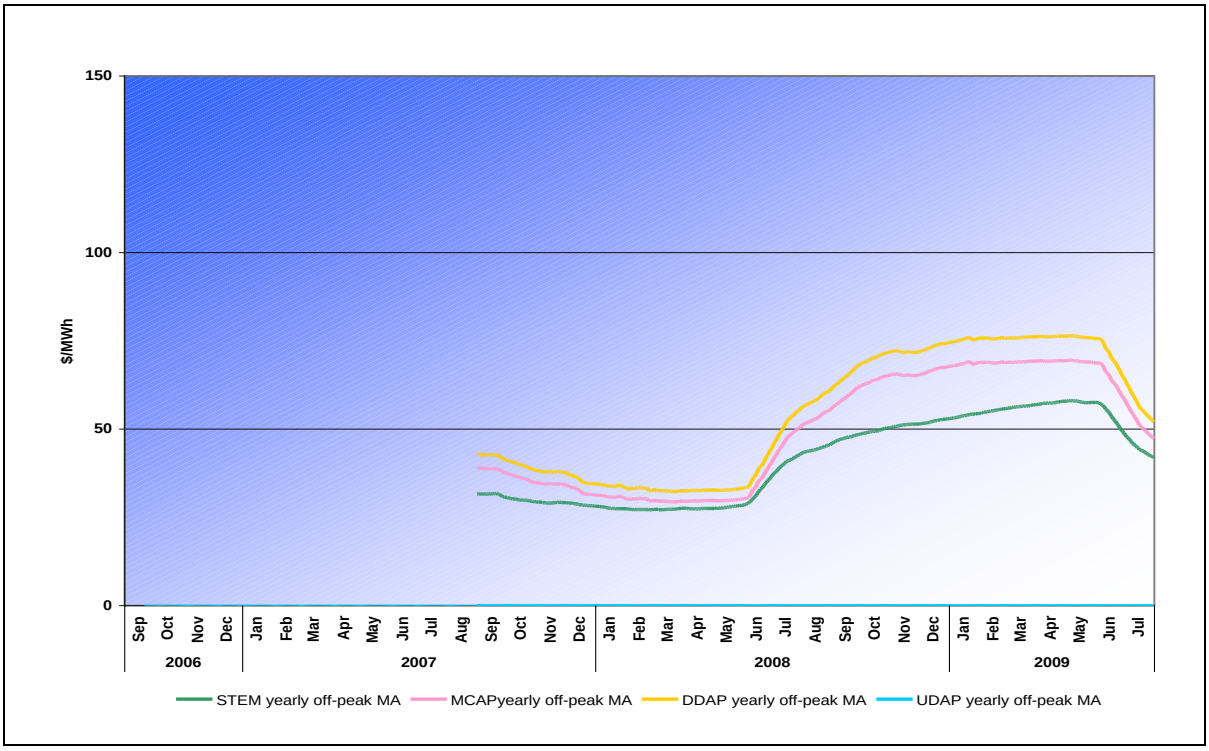
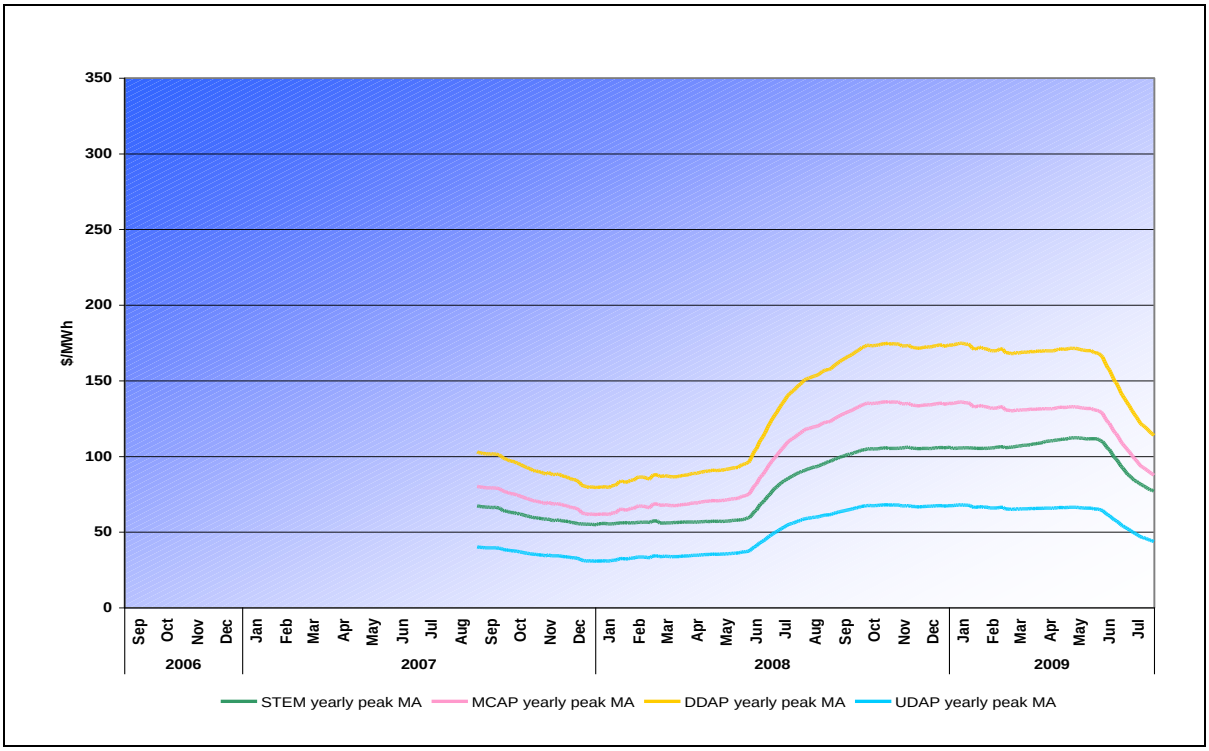


Figure 15: Annual moving average peak STEM and Balancing prices



3.4.2 Volatility of Balancing prices

As indicated by the price trends in Figure 8 and Figure 11, the level and volatility of both STEM and Balancing prices are currently at their lowest level since market commencement.

Volatility in Balancing prices is more accurately analysed by determining means and standard deviations. The means and standard deviations (as well as the maxima and minima) of Balancing prices are illustrated in Figure 36 through to Figure 40 in Appendix 3. In general, peak prices are more volatile than off-peak prices for MCAP and DDAP, as was the case for STEM Clearing Prices. As with off-peak STEM Clearing Prices, the volatility of off-peak MCAPs and DDAPs has diminished since the Varanus Island incident. Peak MCAPs and DDAPs, as with peak STEM Clearing Prices, have also become much less volatile since July 2008.

3.4.3 High Balancing prices

The Market Rules require an examination of both the incidence and causes of high Balancing prices.

As with STEM Clearing Prices, the incidence of high Balancing prices is examined by considering the proportion of time that Balancing prices are at the Energy Price Limits and by considering the price duration curve for Balancing prices.

Figure 16 illustrates the proportion of Peak Trading Intervals and Off-Peak Trading Intervals during which MCAPs were at the Maximum STEM Price. This shows that MCAPs were regularly at the Maximum STEM Price during Peak Trading Intervals in the first few months of the market, over the summer of 2007/08 and from June to September 2008 during the Varanus Island interruption. MCAPs were also often at the Maximum STEM Price during Off-Peak Trading Intervals during the Varanus Island interruption.

Comparing Figure 5 with Figure 16, it is clear that MCAPs have been at the Maximum STEM Price more frequently than have STEM Clearing Prices.

Figure 16: Proportion of Trading Intervals MCAPs at Maximum STEM Price, by month

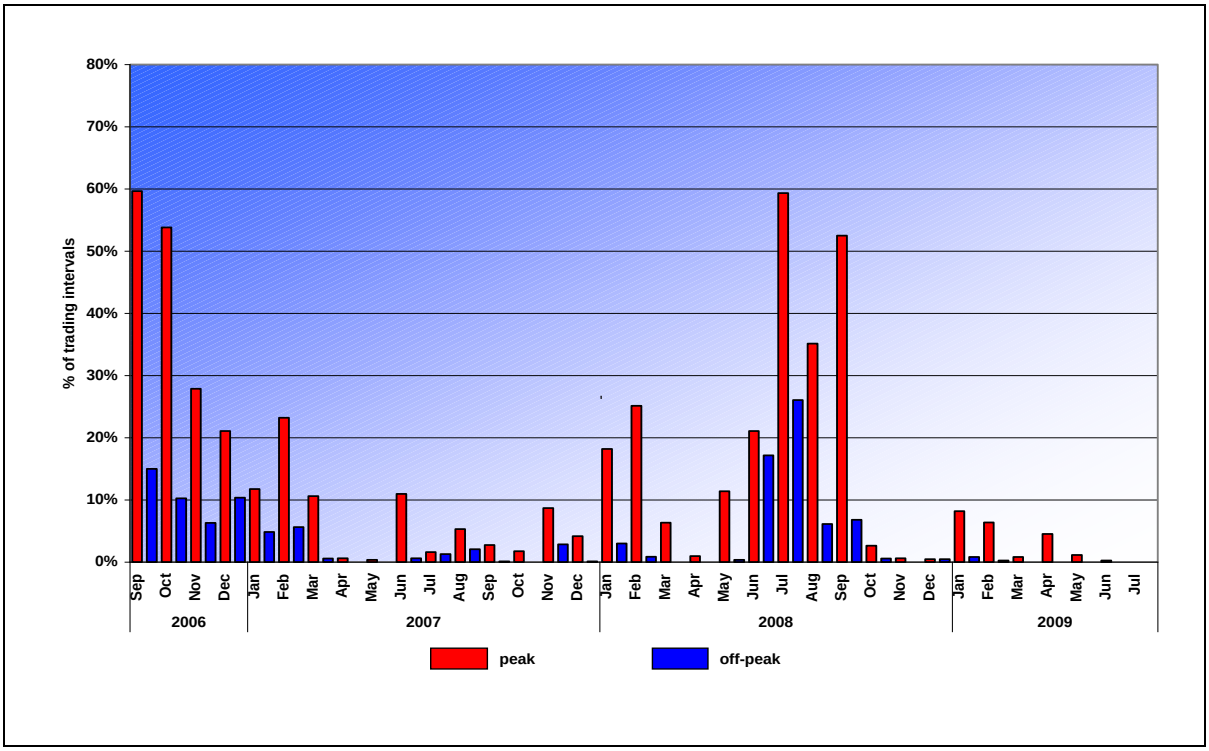


Figure 17 illustrates the proportion of Peak Trading Intervals and Off-Peak Trading Intervals during which MCAPs were at the Alternative Maximum STEM Price, which show that MCAPs have rarely reached the Alternative Maximum STEM Price.

Figure 17: Proportion of Trading Intervals MCAPs at Alternative Maximum STEM Price, by month

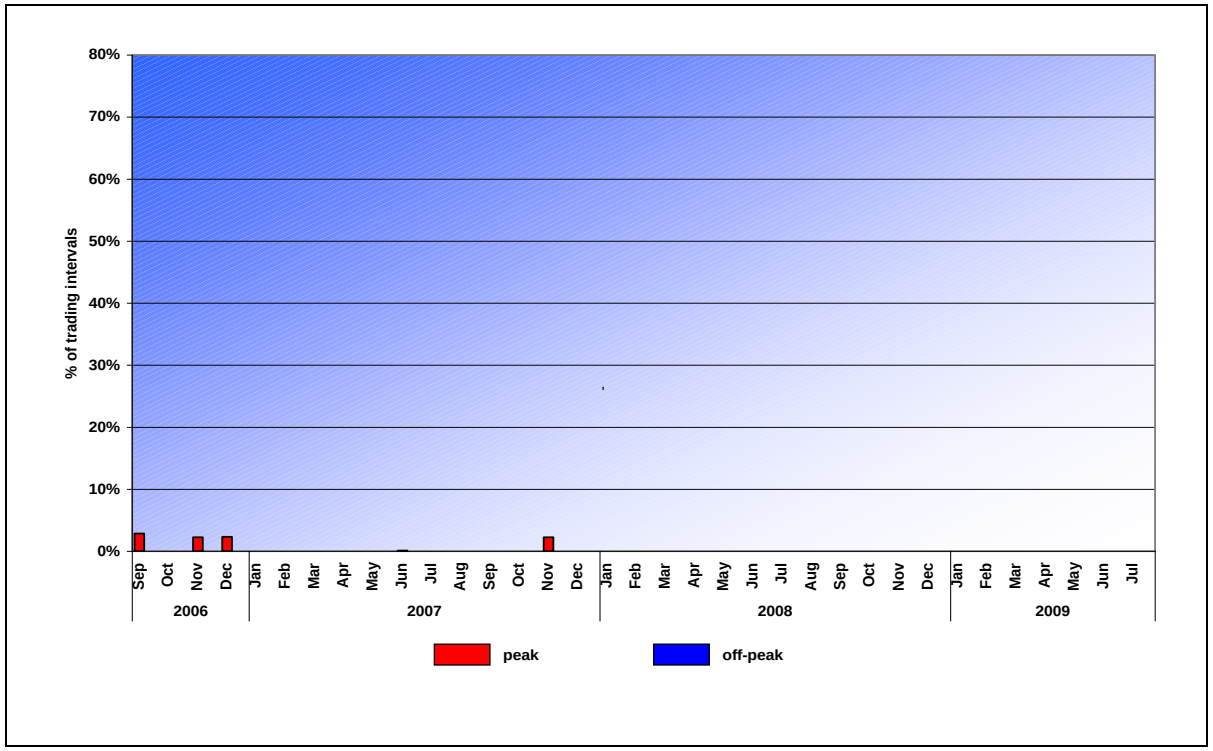
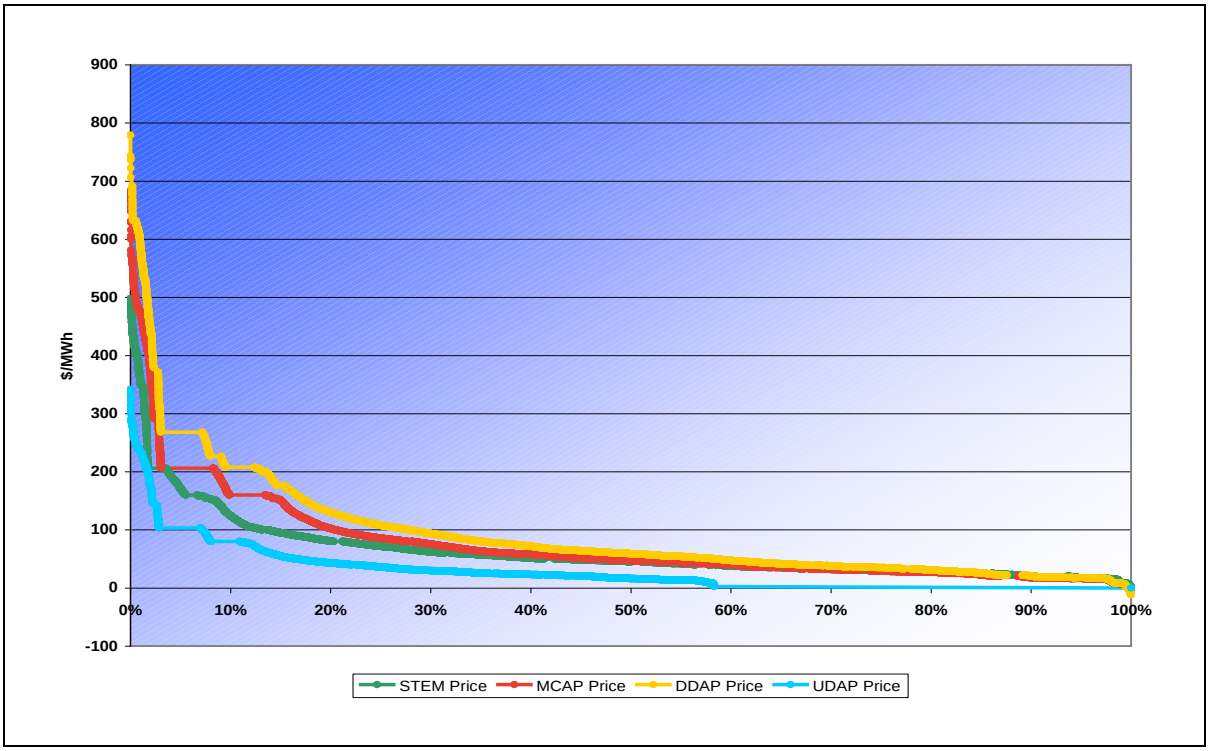


Figure 18 sets out the MCAP duration curve, covering Trading Intervals from market commencement to 31 July 2009. For comparison, Figure 18 also includes the UDAP, DDAP and STEM price duration curves for the same period.[36] As expected, the MCAP is bounded by the UDAP and the DDAP.

As can be seen in Figure 18, the price duration curve for MCAPs follows the price duration curve for STEM Clearing Prices relatively closely, although high MCAPs occur more frequently than high STEM Clearing Prices. A notable divergence between the MCAP and STEM Clearing Prices is around the $100/MWh point – STEM Clearing Prices are less likely to be above $100/MWh than are MCAPs. This reflects the prior observation that MCAPs tend to be at the Maximum STEM Price more frequently than STEM prices.

[36] The price duration curves for peak and off-peak periods are set out in Figure 29 to Figure 30 of Appendix 3.

Figure 18: Price duration curve for MCAPs (21 September 2006 to 31 July 2009)



Clause 2.16.4(f) of the Market Rules requires the calculation of the correlation between capacity available in Balancing and the incidence of high prices. When considering the correlation between STEM Clearing Prices and quantities offered into the STEM, the correlation between capacity available in Balancing and the incidence of high Balancing prices will fail to usefully capture key determinants of Balancing prices. Therefore, correlations are not included in this report, but the Authority is continuing to work with the IMO on more appropriate forms of analysis to explain Balancing prices (see section 3.19 below for more details).

In addition to analysing the key determinants of high prices in the STEM, clause 2.16.4(g) requires the IMO to explore the key determinants for high Balancing prices. This is also a matter to be considered by the joint ERA-IMO working group process outlined in section 3.19 below.

3.5 Reserve Capacity Auction offers

Clause 2.16.2(dA) of the Market Rules requires that the MSDC identify all Reserve Capacity Auction offers. As no Reserve Capacity Auction has been required to date, no auction offers can be reported.

3.6 Bilateral quantities

Clause 2.16.2(e) of the Market Rules requires that the MSDC identify all bilateral quantities scheduled with the IMO.

Bilateral quantities scheduled with the IMO are classified as confidential information. In principle, information on bilateral quantities could be aggregated and included in this

public version of the report. However, at this still early stage of the market, the majority of bilateral quantities are traded between Verve Energy and Synergy, so that aggregation would not necessarily mask the data. As a result, information on the bilateral quantities scheduled with the IMO has not been presented in this public version of the report.

Nevertheless it can be noted that total bilateral quantities scheduled with the IMO have remained relatively consistent over time. Certainly, total bilateral quantities show a seasonal trend, with greater quantities and some spikes in quantities occurring during summer, but, on the whole, quantities have remained relatively steady.

3.7 Short Term Energy Market Offers and Bids

Clause 2.16.2(f) of the Market Rules requires that the MSDC identify all STEM Offers and STEM Bids, including both quantity and price terms.

The Market Rules require that the IMO determine STEM Offers and STEM Bids for each Market Participant and for each Trading Interval that a STEM Submission is received. The IMO determines STEM Offers and STEM Bids by converting a Market Participant's Portfolio Supply Curve and Portfolio Demand Curve into a single STEM price curve, and then converting this into STEM Offers and STEM Bids relative to the Market Participant's net bilateral position.

3.7.1 Short Term Energy Market Offers

STEM Offers reflect an increase in generation or a decrease in consumption. Figure 19 illustrates the daily average quantity of STEM Offers per Trading Interval for all Market Participants. The majority of energy has consistently been offered at prices equal to the Maximum STEM Price and the Alternative Maximum STEM Price.[37] Smaller volumes tend to be offered at prices below the Maximum STEM Price, and the extent of offers below the Maximum STEM Price varies significantly over time.

STEM Offers for each Market Participant are separately set out in Figure 41 to Figure 49 in Appendix 3. These figures show clear differences in the volumes and prices at which Market Participants have offered quantities into the STEM.

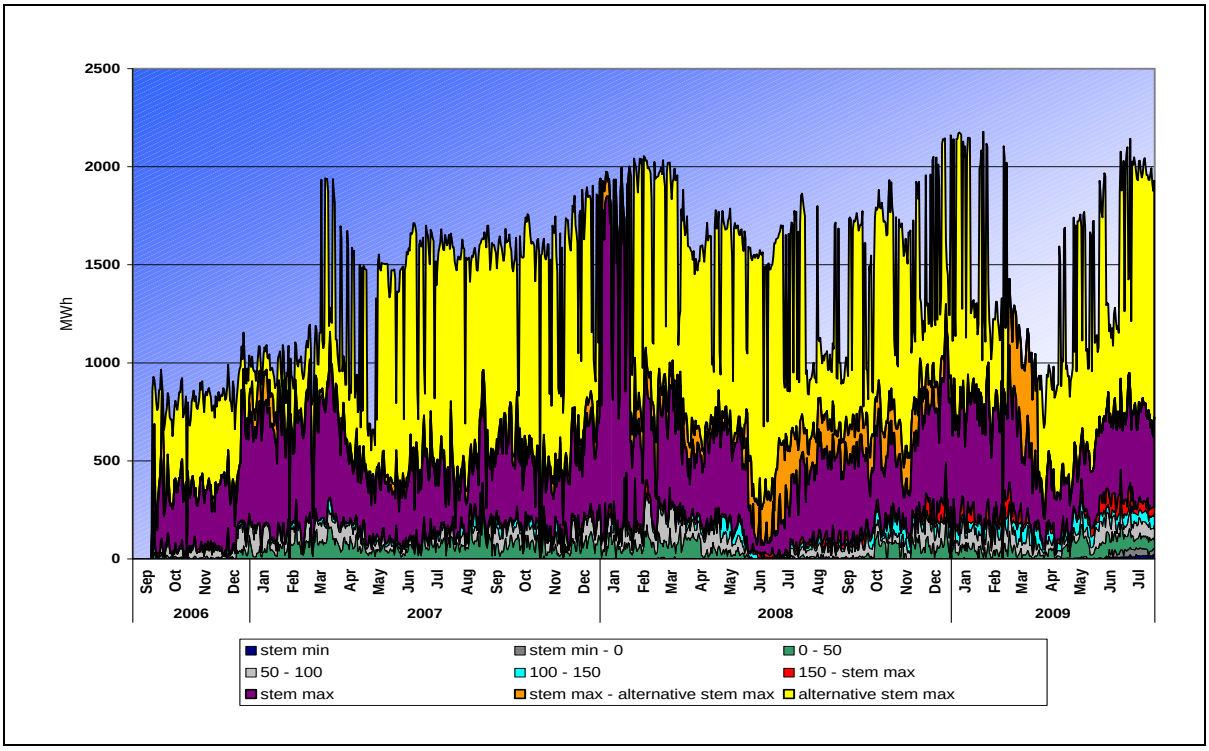
As seen in Figure 49 in Appendix 3, Verve Energy consistently offers significant volumes into the STEM, with the majority of Verve Energy's offers priced at the Maximum STEM Price. Since November 2008, Verve Energy has tended to offer larger volumes at prices below the Maximum STEM Price, with these offers accounting for a significant proportion of Verve Energy's total offers. As seen in Figure 48 and Figure 42, Synergy and Alinta also continue to offer significant volumes into the STEM, primarily priced at the Alternative Maximum STEM Price.

The most significant change in STEM Offers since the 2008 Minister's Report has resulted from the entry of NewGen and Griffin Power. As seen in Figure 44 and Figure 45 in Appendix 3, since the beginning of the 2008/09 Capacity Year, both NewGen and Griffin Power have at times offered significant volumes into the STEM, in a range of price bands.

[37] In constructing the STEM Offers and STEM Bids, a Market Customer's demand that is covered in a Bilateral Contract is defined as a STEM Offer. Since the value of electricity for end users is high, as evidenced in high value of lost load (VOLL) in the National Electricity Market, Market Customers normally price reductions in their demand to reflect the high value for that electricity. In the WEM, this high priced demand becomes STEM Offers at the Alternative Maximum STEM Price. Thus, large quantities offered at the Alternative Maximum STEM Price are to be expected in the STEM.

NewGen's offers have tended to be priced at the Maximum STEM Price, while Griffin Power has made offers at a range of prices.

Figure 19: Daily average quantity of STEM Offers (cumulative MWh per Trading Interval)



3.7.2 Short Term Energy Market Bids

STEM Bids reflect a decrease in generation or an increase in consumption. Figure 20 illustrates the daily average quantity of STEM Bids per Trading Interval, for all Market Participants.

By construction, the high level of Market Customer bilateral commitment - in terms of its demand - will result in the volume of STEM Bids being lower than the volume of STEM Offers. This is evident in a comparison of Figure 20 and Figure 19.

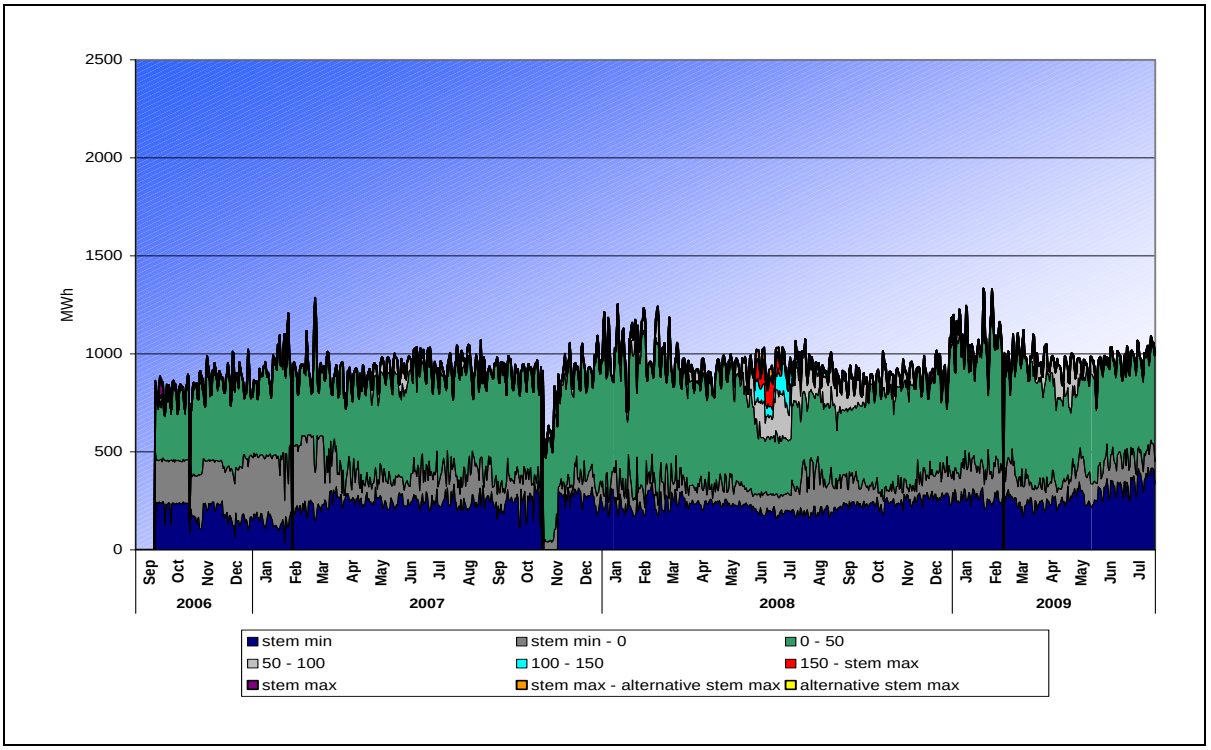
As can be seen in Figure 20, significant quantities of energy have consistently been bid in the STEM between the Minimum STEM Price and $50/MWh. In the STEM construction this outcome would be expected – given it covers quantities already contracted and represents must-run[38] and lower cost capacities (such as coal fired generators) which can be expensive to shutdown and restart. Quantities have been bid at higher prices only infrequently, including the period following the Varanus Island incident, when STEM Bids reflected an increase in the cost of supplying energy during this time.

STEM Bids for each Market Participant are set out separately in Figure 50 through Figure 58 of Appendix 3. These figures show clear differences in the prices and volumes at which Market Participants have bid quantities in the STEM.

[38] Generator co-located with, and providing steam to, an industrial plant.

As with STEM Offers, Verve Energy accounts for the largest volumes of STEM Bids. Figure 58 in Appendix 3 illustrates that Verve Energy has consistently bid significant volumes in the STEM, principally at low or negative prices. Alinta has also consistently bid significant volumes in the STEM, almost entirely at the Minimum STEM Price. The biggest change in STEM Bids since the beginning of the 2008/09 Capacity Year has resulted from the entry of NewGen and Griffin Power, who have at times bid significant volumes into the STEM, in a range of price bands.

Figure 20: Daily average quantity of STEM Bids (cumulative MWh per Trading Interval)



3.7.3 Short Term Energy Market traded volumes

Although not required under the Market Rules, this section provides data on STEM traded volumes.

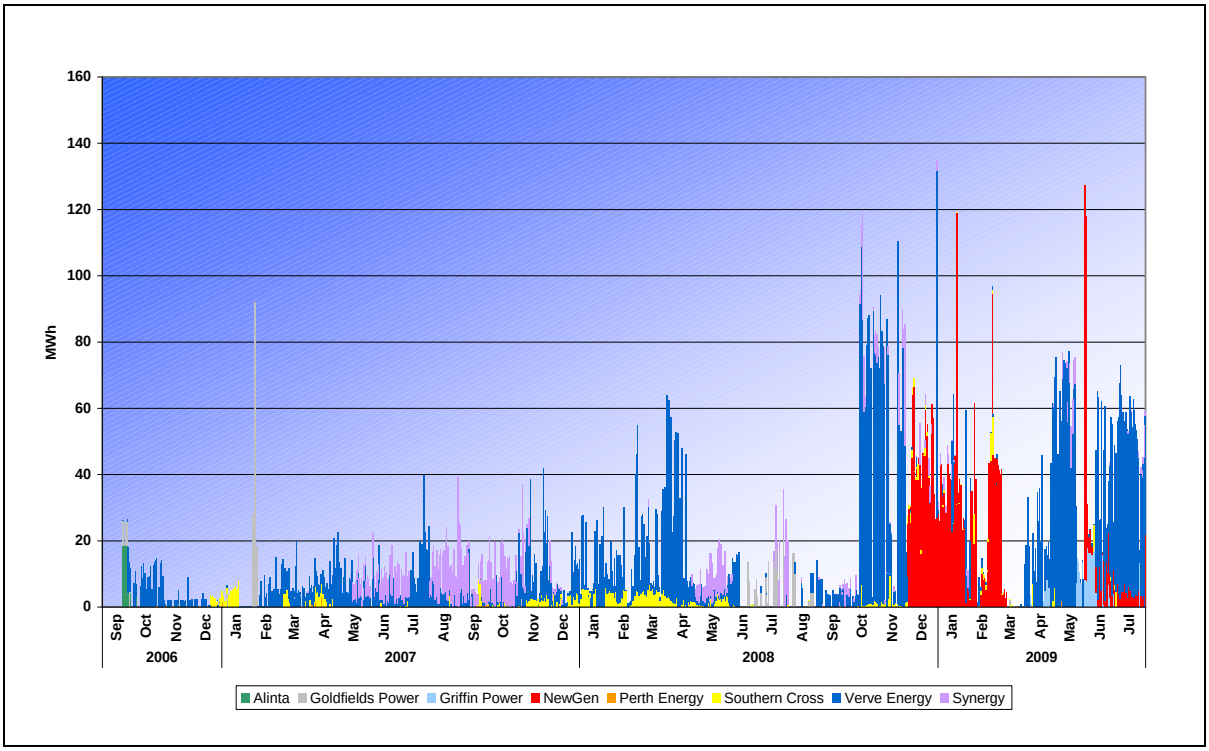
Figure 21 and Figure 22 illustrate the daily average volume traded in the STEM per Trading Interval, for all Market Participants. In Figure 21 and Figure 22, the daily average volume is disaggregated into the buying and selling Market Participant, respectively.

The historical volume traded in the STEM remained relatively low until the commencement of the 2008/09 Capacity Year in October 2008. Since then traded volumes have increased substantially, which can be largely attributed to the entry of NewGen and Griffin Power in that Capacity Year. NewGen initially sold and subsequently purchased significant volumes in the STEM. Since April 2009, Griffin Power has sold significant volumes in the STEM.

That increasing new entry into the generation sector has coincided with increased trading volumes in the STEM could be taken as an indication that as the WEM facilitates new entry in the generation sector, the STEM will become more liquid and provide a price

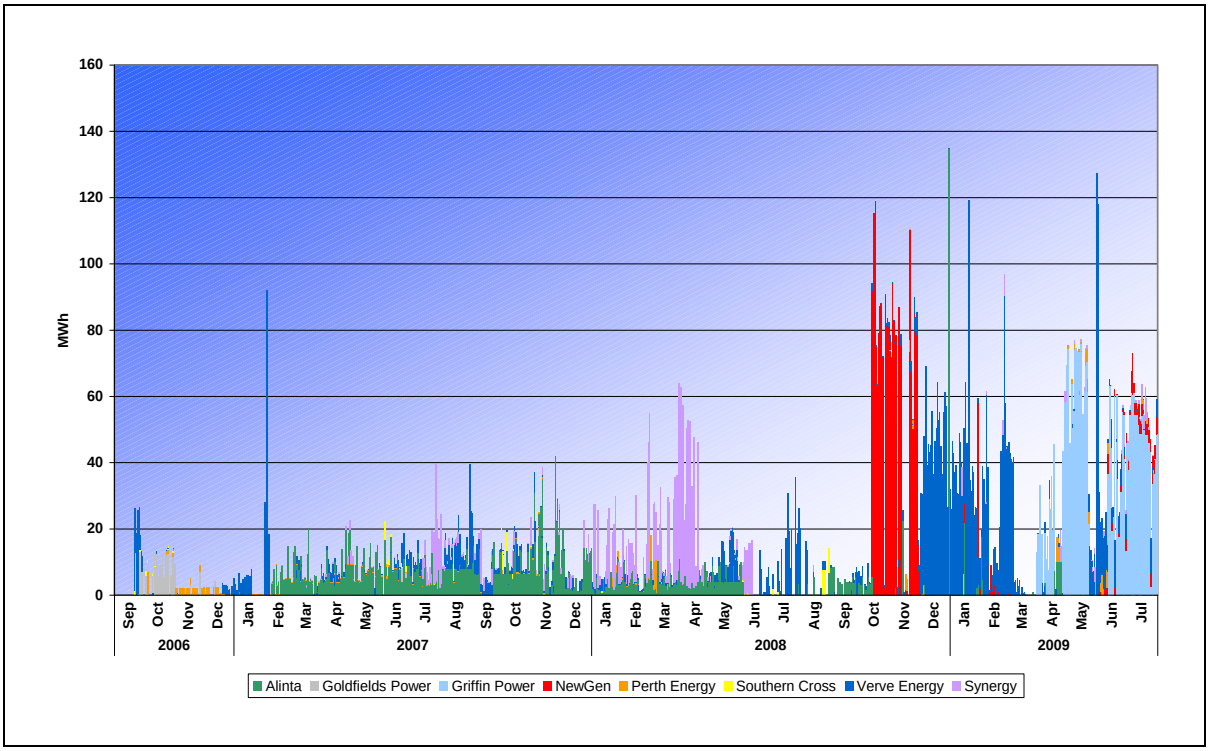
signal that is more representative of a competitive market. However, the Authority notes that trading in the STEM by NewGen and Griffin Power (including STEM Bids and Offers) has been volatile and that at this stage it is unclear whether the increase in volumes traded in the STEM will be sustained.[39]

Figure 21: Daily average quantities bought in the STEM (MWh)



[39] As noted in the Authority's Discussion Paper, the STEM is designed to support the Bilateral Contract market (as explained in IMO's WEM Design Summary document from September 2006: http://www.imowa.com.au/Attachments/MarketSummarySeptember2006.pdf). The STEM provides generators with the opportunity to deviate from their bilateral positions: producing more and selling into the market if production costs are lower than the market price, or producing less and buying from the market if production costs are higher than the market price. The STEM also provides retailers with the same ability to trade around their bilateral positions. Recognising this, STEM Bids and STEM Offers are defined relative to Bilateral Contract positions. An implication of this is that the STEM traded quantity is not critical to determining the STEM Clearing Price.

Figure 22: Daily average quantities sold in the STEM (MWh)



3.8 Fuel Declarations

A Market Participant submitting a STEM Submission must include a fuel declaration.[40] Clause 2.16.2(gA) of the Market Rules requires that the MSDC identify all Fuel Declarations. There is also a requirement under Clause 2.16.4(cA) to calculate any consistent or significant variations between Fuel Declarations and the actual real-time operation of a Market Participant.

Table 6 summarises the Fuel Declarations for each dual fuel facility, showing the percentage of all Trading Intervals for which each dual fuel facility was assumed to be operating on Non-Liquid and Liquid Fuels: for the 2007/08 Capacity Year and the 2008/09 Capacity Year up to 31 July 2009. Dual fuel facilities tend to declare either liquid or non-liquid for the majority of the Trading Intervals for which they make a declaration, suggesting that dual fuel facilities have a primary fuel supply, with occasional use of a secondary fuel supply. Fuel Declarations for these facilities are influenced by the expected availability of gas, although Market Participants are not always aware of gas supply constraints at the time that they are required to make their STEM Submissions. This can result in variations between Fuel Declarations and the actual operation of a facility. The IMO monitors variations between Fuel Declarations and actual operation.

[40] See Clause 6.6.1.

Table 6: Fuel Declarations (last 2 Capacity Years)[41]

Participant	Resource Name	Liquid declaration Cap year 2007/08	Non-liquid declaration Cap year 2007/08	Liquid declaration Cap year 2008/09	Non-liquid declaration Cap year 2008/09
Alcoa	ALCOA_KWI			9.5%	
Alcoa	ALCOA_PNJ			9.5%	
Alcoa	ALCOA_WGP			99.0%	
Alinta	ALINTA_WGP_GT	96.7%	0.3%	99.7%	
Alinta	ALINTA_WGP_U2			98.0%	1.3%
Verve Energy	KEMERTON_GT11	3.6%	96.2%		99.7%
Verve Energy	KEMERTON_GT12	80.3%	19.4%	83.9%	15.8%
Verve Energy	KWINANA_G3	33.1%	66.7%	1.0%	
Verve Energy	KWINANA_G4	20.5%	78.7%		30.3%
Verve Energy	KWINANA_G5	7.9%	91.8%	0.3%	99.3%
Verve Energy	KWINANA_G6	1.4%	96.7%	17.8%	81.9%
Verve Energy	KWINANA_GT1	99.7%		99.7%	
Verve Energy	PINJAR_GT1	6.6%	93.2%		99.7%
Verve Energy	PINJAR_GT2	82.5%	17.2%	99.3%	0.3%
Verve Energy	PINJAR_GT3	6.3%	93.4%		99.7%
Verve Energy	PINJAR_GT4	86.6%	13.1%	99.7%	
Verve Energy	PINJAR_GT5	15.3%	84.4%		99.7%
Verve Energy	PINJAR_GT7	92.1%	7.7%	99.7%	
Goldfields Power	PRK_AG	99.6%	0.1%	99.7%	
Southern Cross	STHRNCRS_EG	23.8%		7.9%	

3.9 Availability Declarations

A Market Participant submitting a STEM Submission must include an Availability Declaration on net available energy.[42]

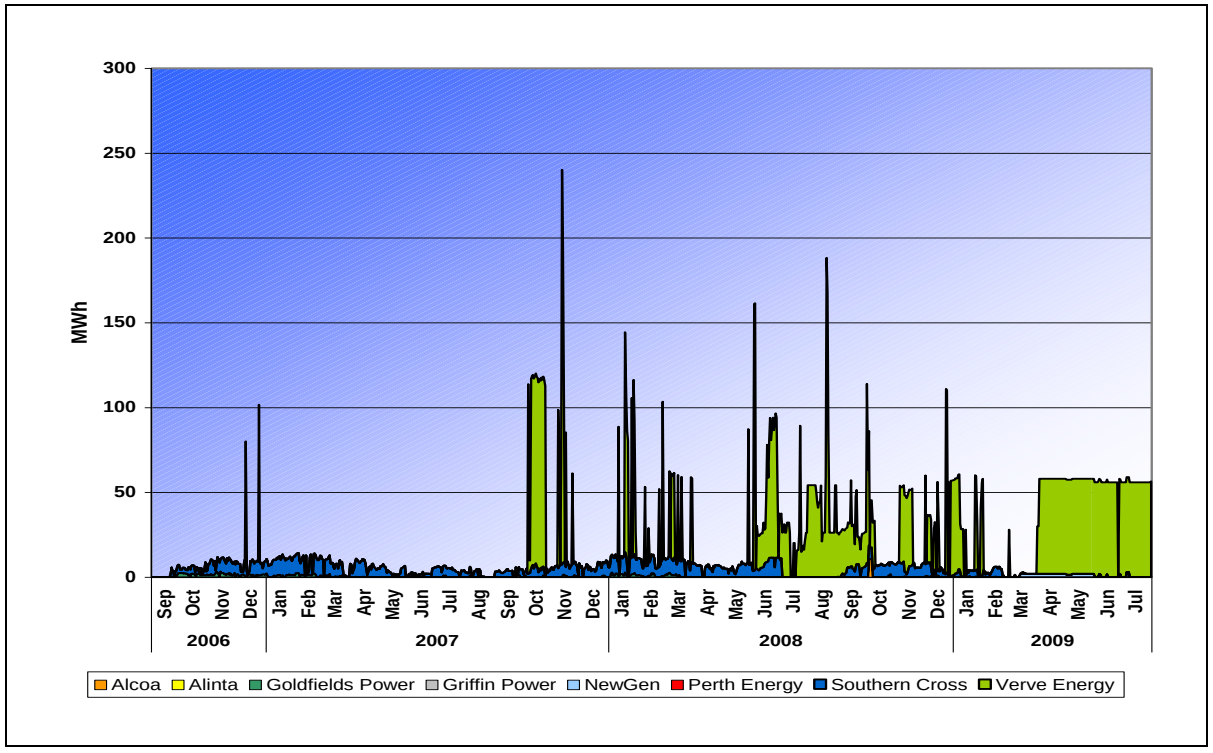
Clause 2.16.2(gB) of the Market Rules requires that the MSDC identify all Availability Declarations. There is also a requirement under Clause 2.16.4(cA) to calculate any consistent or significant variations between Availability Declarations and the actual real-time operation of a Market Participant's facility.

Figure 23 illustrates daily average Availability Declarations by Market Participant. Since the beginning of the 2007/08 Capacity Year, Availability Declarations have increased, principally from Verve Energy (accounts for the majority of generating capacity in the market). In the 2008 Minister's Report, the Authority noted that the IMO considered that a key reason for the increase in Availability Declarations was the increased sophistication regarding compliance among Market Participants.

[41] Note that Market Participants are not required to make a Fuel Declaration for dual-fuel facilities for each Trading Interval (but only for those Trading Intervals for which they submit a STEM Submission regarding that facility), so the sum of the percentage of Trading Intervals for which a Non-Liquid Fuel declaration was made, and the percentage of Trading Intervals for which a Liquid Fuel declaration was made need not equal 100 per cent. The Fuel Declaration is to set out, for each of the Market Participant's dual-fuel facilities, whether the facility was assumed to be operating on Non-Liquid Fuel or Liquid Fuel in forming the Portfolio Supply Curve.

[42] See Clause 6.6.1. The Availability Declaration is to set out, for each Trading Interval and for each of the Market Participant's facilities, the difference between the energy available from the facility based on its Standing Data (adjusted to account for any energy committed to providing Ancillary Services and any energy unavailable due to outages reported by the IMO) and the energy assumed to be available from the facility in forming the Portfolio Supply Curve for the Trading Interval. Only quantities greater than zero need to be reported in the Availability Declaration.

Figure 23: Daily average Availability Declarations (MWh unavailable per Trading Interval)



Significant variations between Availability Declarations and the actual real-time operation of a Market Participant are assessed by comparing:

- the remaining capacity available after taking into account quantities declared in an Availability Declaration, with
- the total (loss factor-adjusted) quantity supplied, as measured by System Management's Supervisory Control and Data Acquisition (**SCADA**) system.

If, on the basis of this comparison, the remaining capacity available is less than the quantity supplied, this indicates that a facility has been available to supply the market to a greater extent than was indicated in the STEM Submission for that facility. The significance of this statistic is to detect if a Market Participant is declaring falsely that a low cost capacity is unavailable. By leaving out low cost capacities the Market Participant will be able to put in a submission with higher cost schedule. This could result in a higher STEM Clearing Price. The Market Participant could then generate with the low cost capacity which is truly available and make an excessive profit.

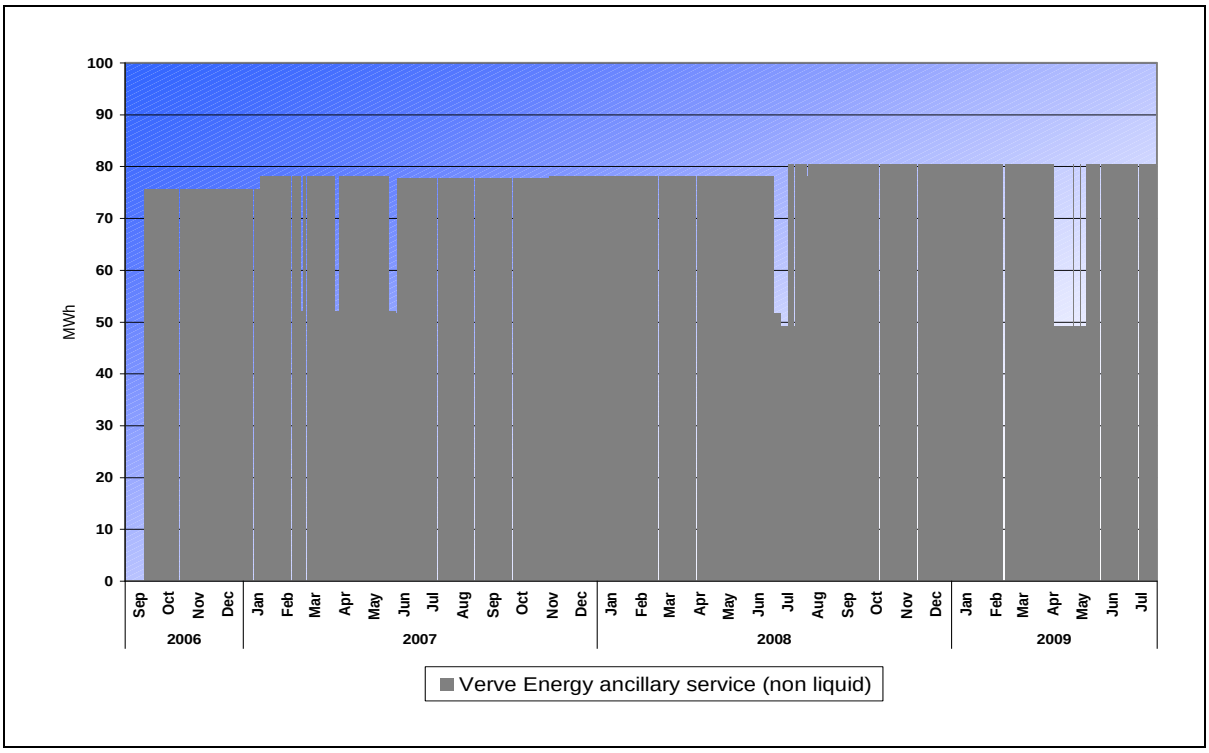
Significant variations between Availability Declarations and the actual real-time operation has been determined for each facility in the market, but the information is commercially sensitive and so is not presented in this public version of the report.

3.10 Ancillary Service Declarations

A Market Participant that is a provider of Ancillary Services must include an Ancillary Services declaration in its STEM Submission.[43] Clause 2.16.2(gC) of the Market Rules requires that the MSDC identify all Ancillary Service Declarations. There is also a requirement under Clause 2.16.4(cA) to calculate any consistent or significant variations between Ancillary Service Declarations and the actual real-time operation of a Market Participant.

Figure 24 shows that the only Market Participant to submit an Ancillary Service declaration has been Verve Energy, with the quantities of Ancillary Services fairly consistent at between 70-80 MWh per Trading Interval.[44]

Figure 24: Daily average Ancillary Services declarations (MWh per Trading Interval)[45]



As Verve Energy is the only Market Participant to submit an Ancillary Service declaration, there has been no analysis of significant variations between declarations and the actual outcomes. In the event that other Market Participants begin to provide Ancillary Services, the Authority will commence reporting on variations between declarations and the actual real-time operation of facilities.

[43] See Clause 6.6.1. The Ancillary Services declaration is to set out the MWh of energy, from both liquid and non-liquid facilities, which the Market Participant has not included in the Portfolio Supply Curve because it expects to have to maintain surplus capacity with which to provide Ancillary Services.

[44] The decreases in Ancillary Service Declarations from May to July 2008, and from April to May 2009 were due to Collie Power Station being on outage during those times.

[45] Note that Verve Energy's Ancillary Services Declarations have only included quantities for Non-Liquid Fuel. There was no Ancillary Services quantity evident for 27 October 2006 due to a market suspension on that day, and no Ancillary Services quantity evident for 7 March 2007 because System Management did not request that Verve Energy provide Ancillary Services on that day (peak demand was recorded on 7 March).

3.11 Variations in Short Term Energy Market Offers and Bids

Clause 2.16.2(h) of the Market Rules requires that the MSDC identify any substantial variations in STEM Offers and STEM Bid prices or quantities relative to recent past behaviour.

The prices and quantities of STEM Offers and STEM Bids by each Market Participant are illustrated in Figure 41 through Figure 58 in Appendix 3. As has been observed in previous Minister's Reports, there are significant variations in the prices and/or quantities of offers and bids of all Market Participants. In many cases, these variations occur both in the short-term (day-to-day) and longer term (since market commencement).

Significant variations in STEM Offers and STEM Bids present challenges in the development of a robust system for identifying substantial variations relative to recent past behaviour. Development of a robust system requires conceptual issues to be addressed: including what constitutes a 'substantial variation' in prices or quantities and the definition of 'recent past behaviour'. The resolution of these two issues will impact on the variations that are required to be identified by the MSDC.

In attempting to track how a Market Participant STEM offers and bids change over time the IMO has defined a variable summarising the participant offers for a Trading Interval into a single number and similarly for bids. The Authority has been provided with a record of this variable for each of the Market Participants since market commencement. The Authority's Secretariat will examine how this variable could be used given the identified conceptual issues.

3.12 Evidence of Market Customers overstating consumption

Clause 2.16.2(hA) of the Market Rules requires that the MSDC identify any evidence that a Market Customer has significantly over-stated its consumption, as indicated by its Net Contract Position, with a regularity that cannot be explained by a reasonable allowance for forecast uncertainty or the impact of loss factors.

In order to identify whether a Market Customer has significantly overstated its consumption, it is necessary to determine both the Market Customer's actual load and the Market Customer's planned load.

- Actual load is determined on the basis of settlement quantities for a Market Customer. This provides a measure of real-time load, taking into account any Dispatch Instructions.
- Planned load is determined in a different way for stand-alone Market Customers and Market Customers that are also Market Generators:
  - For stand-alone Market Customers, planned load is measured as its Net Contract Position.
  - For Market Customers that are also Market Generators, planned load is measured as demand as set out in the Market Customer's Resource Plan. The reason is that Net Contract Position does not provide a useful measure of planned load for Market Customers that are also Market Generators – these participants are able to meet their own demand using their own generation

facilities, so that this demand will not be reflected in their Net Contract Position.

The extent to which a Market Customer over-states its consumption is determined by calculating actual load less planned load. If actual load less planned load is positive, this indicates that the Market Customer has under-stated its consumption. If actual load less planned load is negative, this indicates that the Market Customer has over-stated its consumption. To understand the extent of any over-statement or under-statement, any over-stated or under-stated amount is analysed as a proportion of planned demand.

This information is confidential and is not presented in this public version of the report.

3.13 Capacity available through Balancing

Clause 2.16.2(i) of the Market Rules requires that the MSDC identify the capacity available through Balancing from Scheduled Generators and Non-Scheduled Generators and Dispatchable Loads.

At this stage, the IMO calculates the capacity available through Balancing from Market Participants other than Verve Energy. This is because, in effect, all of Verve Energy's capacity is available to provide Balancing. The IMO derives the capacity available through Balancing from a facility as:

- the facility capacity limit;
- less the loss-factor adjusted generation for the facility (as set out in the Resource Plan); and
- less quantities for the facility set out in an Availability Declaration.

This information is confidential and is not presented in this public version of the report; however, aggregated information can be reported. During the first year of the market's operation, the total capacity available through Balancing had been relatively steady, at around 60 MWh per Trading Interval. Beginning in October 2007, the quantity available through Balancing increased substantially, and averaged around 240 MWh per Trading Interval until September 2008. Between October 2008 and July 2009, the quantity available through Balancing increased again, and fluctuated between 240 MWh and 660 MWh per Trading Interval.

3.14 Number and frequency of Dispatch Instructions

Clause 2.16.2(j) of the Market Rules requires that the MSDC identify the frequency and nature of Dispatch Instructions to Market Participants other than Verve Energy.

A Dispatch Instruction is an instruction issued by System Management to a Market Participant other than Verve Energy directing the participant to vary the output or consumption of one of its facilities from the level indicated in its Resource Plan, or to vary the output or consumption of one of its facilities holding Capacity Credits.

Figure 25 illustrates the number of Trading Intervals per Trading Day for which there were increment Dispatch Instructions and decrement Dispatch Instructions, from market commencement to 31 July 2009.[46] As noted in the 2008 Minister's Report, it is clear that there are two outliers on 3 January 2008 and 24 January 2008, where the total number of

[46] Note that this counts a Dispatch Instruction for multiple Trading Intervals as multiple Dispatch Instructions.

Dispatch Instructions increased to above 900 in a Trading Day. The first of these was the result of gas constraints due to a failure at the North-West shelf and the latter was due to large outages on the system.

Leaving aside the two outliers discussed above, it is clear from Figure 26 that Dispatch Instructions were most frequently issued during the first few months following market commencement, and during higher demand periods in summer and winter. Dispatch Instructions also occur during gas constraints, which lead to an increased likelihood that Verve Energy's facilities would run on Liquid Fuel. This, in turn, means that System Management relies on other Market Participant's facilities to provide Balancing.

Figure 25: Daily average number of Dispatch Instructions

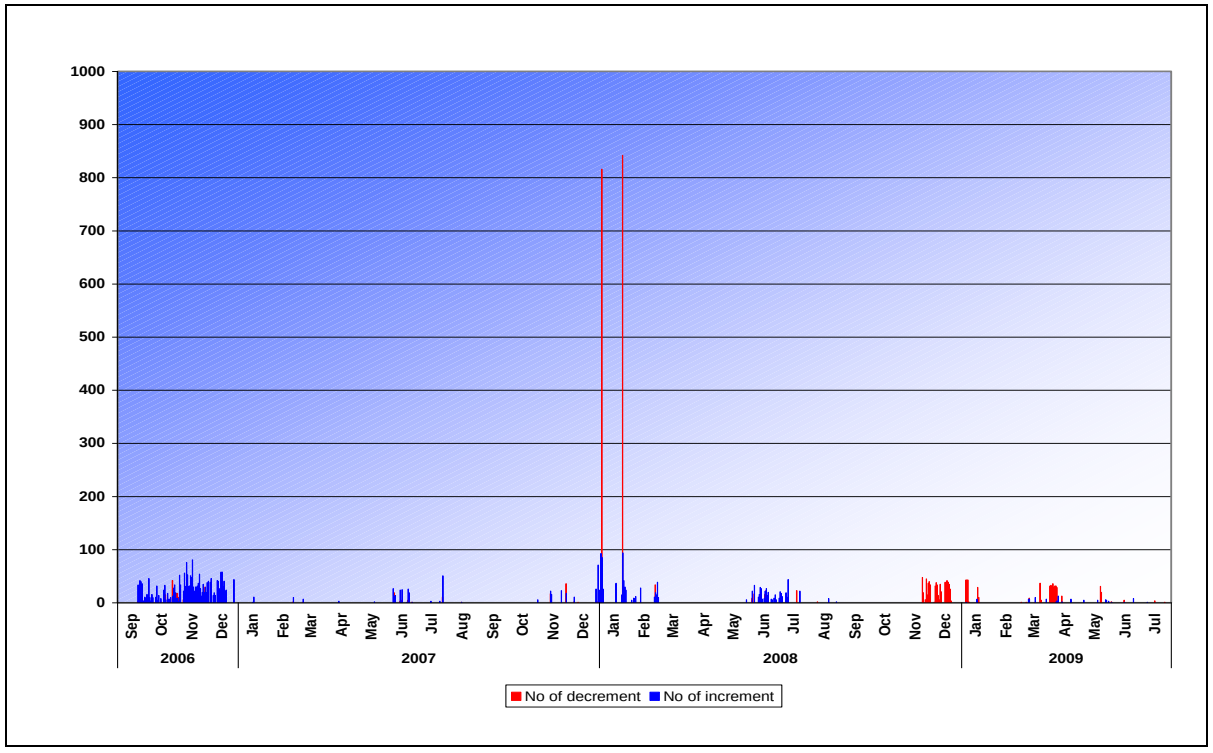
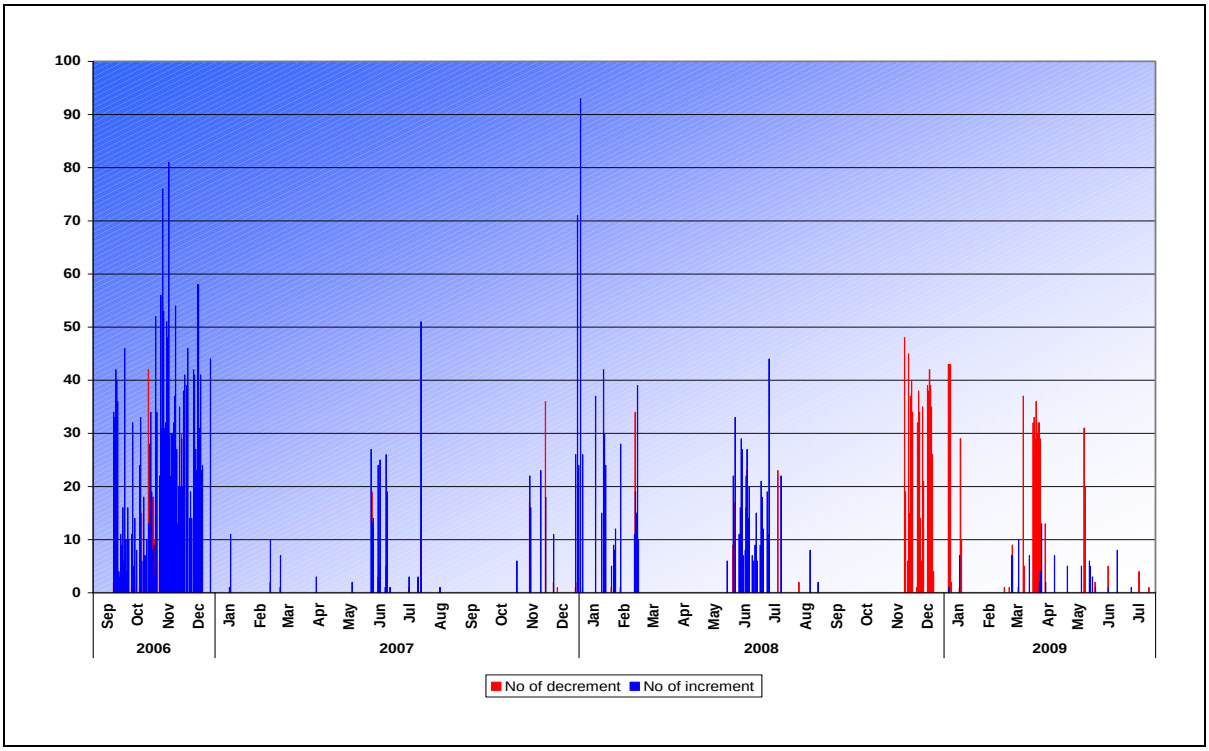


Figure 26: Daily average number of Dispatch Instructions – outliers removed



3.15 Number and frequency of outages

Clause 2.16.2(k) of the Market Rules requires that the MSDC identify the number and frequency of outages of Scheduled Generators and Non-Scheduled Generators, and Market Participants' compliance with the outage scheduling process.

Information on outages is confidential and is not presented in this public version of the report; however, aggregated information can be reported. The Authority notes that planned outages tend not to occur during January, February and March, in line with the low level of reserve margins prevailing at these peak demand times. In respect of forced outages the Authority notes that, as would be expected, there is no clear seasonal pattern for forced outages.

3.16 Performance in meeting Reserve Capacity obligations

Clause 2.16.2(l) of the Market Rules requires that the MSDC identify the performance of Market Participants with Reserve Capacity obligations in meeting these obligations.

The performance of Market Participants with Reserve Capacity obligations is assessed by comparing the quantity of a facility's forced outages and planned outages to the maximum generating capacity of the facility, as registered by the IMO.

This information is confidential and is not presented in this public version of the report; however, aggregated information can be reported. In particular, the Authority notes that

the forced outage rate for generation plant has been low. Planned outage rates are more variable, reflecting the different stages of generation plant in their maintenance cycles.

3.17 Ancillary Service Contracts and Balancing Support Contracts

Clause 2.16.2(m) of the Market Rules requires that the MSDC identify details of Ancillary Service Contracts and Balancing Support Contracts that System Management enters into.

System Management currently has Ancillary Service Contracts in place with two providers to supply Spinning Reserve in the order of 50 MW. One of these Spinning Reserve contracts pre-dates market commencement and was inherited by System Management upon the disaggregation of the old Western Power, the other is a short extension of an existing contract.

In addition, System Management currently has a deed of undertaking with Verve Energy for the provision of Dispatch Support services in the Eastern Goldfields and north country (Mungarra and Geraldton) regions. This deed is due to expire when the 330kV transmission line to Geraldton is commissioned.

System Management also has an Ancillary Service Contract with Verve Energy for the supply of System Restart from three geographically dispersed Verve Energy sites in the South West Interconnected System (**SWIS**). This contract is due to expire on 30 June 2011.

System Management's progress in procuring Ancillary Service Contracts is discussed in Section 5.4.

System Management has not entered into any Balancing Support Contracts between market commencement and 31 July 2009. Since market commencement Verve Energy has been principally responsible for providing Balancing for the market. The issues surrounding these Balancing arrangements are discussed in Section 4.8.

3.18 Rule Change Proposals

Clause 2.16.2(o) of the Market Rules requires that the MSDC identify the number of Rule change proposals received, and details of Rule change proposals that the IMO has decided not to progress under Clause 2.5.6.

The formal Rule Change Proposal process under the Market Rules commenced on 15 December 2006.

Prior to this, the Office of Energy was responsible for administering the Rule Change Proposal process on behalf of the Minister for Energy. Between market commencement and 15 December 2006, the Office of Energy received 14 Rule Change Proposals, 12 of which were approved, and one of which was deferred until the formal Rule Change Proposal process commenced. There was only one Rule Change Proposal that the Office of Energy did not recommend to the Minister for Energy for approval. This was Rule Change Proposal CR2, submitted by Verve Energy, which proposed that the Maximum STEM Price be set equal to the Alternative Maximum STEM Price.

Information on WEM Rule Change Proposals that have commenced, been rejected or are under development is available on the IMO's web site. Based on this information, since

the commencement of the formal Rule Change Proposal process, the IMO has processed Rule Change Proposals as follows:

- between 15 December 2006 and 31 July 2007, the IMO received nine Rule Change Proposals, all of which had been commenced by the end of 2007;
- between 1 August 2007 and 31 July 2008, the IMO received 36 Rule Change Proposals, all of which have now commenced; and
- between 1 August 2008 and 31 July 2009, the IMO received 37 Rule Change Proposals, 24 of which have now commenced, three of which have been rejected and 10 of which remain under development.

3.19 Other information

Clause 2.16.4(g) requires the IMO to explore the key determinants for high prices in the STEM and Balancing. The Authority reported last year that it would work together with the IMO to develop the most appropriate approach for undertaking this analysis. An IMO-ERA working group has been formed for this purpose to develop an appropriate econometric model.[47] The group includes IMO staff with statistics training and WEM system knowledge. The working group has started with a preliminary list of variables as potential key determinants of high prices and extracted the historical records for these variables. The next step, currently being progressed, is to build a statistical model for evaluation. A working model for STEM Clearing Prices was completed by December 2009. A working model for MCAP is in the process of being evaluated and is expected to be completed early in 2010.

[47] The application of statistical and mathematical methods in the field of economics to describe the numerical relationships between WEM variables such as: temperature, load forecasts, energy prices, plant availability and fuel curtailments.

4 Effectiveness of the Wholesale Electricity Market, the Independent Market Operator and System Management

Clause 2.16.12(b) of the Market Rules requires that the Minister's Report contains the Authority's assessment of the effectiveness of the market, including the effectiveness of the IMO and System Management in carrying out their functions, with discussion of each of:

i) the Reserve Capacity market;

ii) the market for Bilateral Contracts for capacity and energy;

iii) the STEM;

iv) Balancing;

v) the dispatch process;

vi) planning processes; and

vii) the administration of the market, including the Market Rule change process.

This section is structured as follows:

- Section 4.1 provides the Authority's overview of the effectiveness of the WEM;
- Section 4.2 discusses stakeholders' comments on the Wholesale Market Objectives;
- Section 4.3 discusses network connection and planning issues;
- Section 4.4 discusses Reserve Capacity Mechanism issues;
- Section 4.5 discusses locational signals for generation investment;
- Section 4.6 discusses the bilateral market;
- Section 4.7 discusses the STEM;
- Section 4.8 discusses Balancing; and
- Section 4.9 discusses administrative matters, such as the effectiveness of the market institutions and the Rule change process.

4.1 Authority's overview of the effectiveness of the Wholesale Electricity Market

4.1.1 Outline in the Discussion Paper

In the Discussion Paper, the Authority presented some preliminary MSDC data regarding outcomes in the WEM, in relation to the assignment of Capacity Credits through the RCM, energy demand in the SWIS, prices and traded quantities in the STEM, prices and quantities in Balancing and the customer churn in the retail sector. The data presented in the Discussion Paper was consistent with gradually increasing levels of competition and prices that were returning to lower levels following the Varanus Island gas supply interruption in mid-2008.

4.1.2 Oates Report

The Oates Report refers to the main objective of the reforms implemented in 2006 as being the achievement, where practicable, of sustainable lower prices for all customers.[48] In terms of assessing the performance of the market to date, the Oates Report comments that:

> It is clear that the reforms have resulted in progress towards their objectives. Private sector risk investment is occurring, retail competition is emerging and although long term electricity supply contracts with Synergy represent a commitment by the State, the proportion of capacity and energy secured through this approach has been subject to wholesale competition – including competition between the private sector and Verve.[49]

As noted above, the Oates Report went on to identify various external issues facing the industry and made recommendations for dealing with those issues. These are discussed in more detail below under the relevant topic headings.

4.1.3 Review of findings from the 2008 Minister's Report

In its 2008 Minister's Report, the Authority noted that the WEM had generally been operating effectively since it commenced.[50] The Authority particularly highlighted the entry of new generation participants and new generation capacity to the market, as well as the trend towards lower and less volatile prices in the STEM and Balancing. However, the Authority also observed that retail market competition was being stifled by the dominant position of Synergy.

4.1.4 Submissions

Stakeholders generally considered that the market has been effective in relation to meeting the Wholesale Market Objectives.[51] For example, Perth Energy noted that:

- medium to large retail customers have a choice of supplier;
- electricity prices are sending clear investment signals;
- generation capacity is being provided in advance of forecast demand;
- competition is emerging for the provision of Ancillary Services; and
- the dominance of the incumbent generator and retailer is diminishing.

Western Power Networks noted that the Market Rules appear to promote the safe and reliable provision of electricity in the short to medium term, but that longer term energy security does not appear to be addressed. In particular, Western Power Networks expressed concern about whether the market will effectively deliver an appropriate mix of generation plant.[52]

[48] Oates Report, p.5.

[49] Oates Report, p.20.

[50] 2008 Minister's Report, p.46.

[51] Alinta, Infratil, Landfill Gas and Power, Perth Energy, System Management.

[52] This issue is addressed later in Section 4.4.2.

4.1.5 Authority's view

The summary of the data items in the MSDC and the analysis of the data undertaken by the IMO, as set out in section 3 of this report, provides an overview of the operation of the market to date. In general, this analysis indicates that the market has been operating effectively.

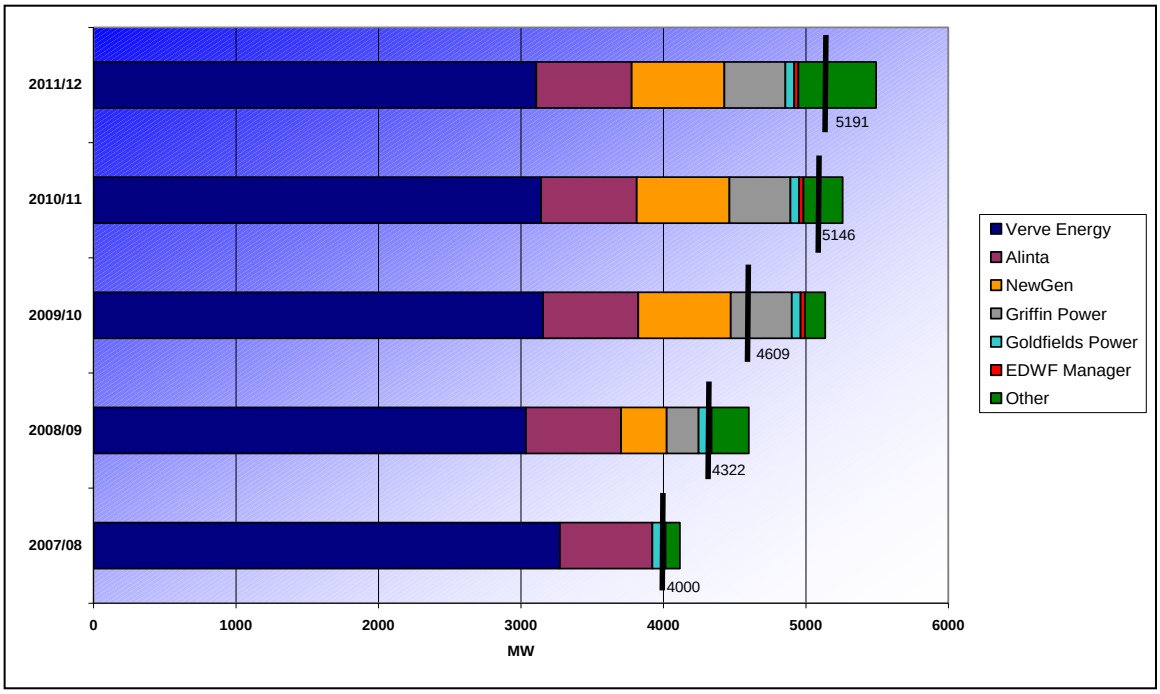
In particular, the Authority considers that in order for the market to operate effectively and to meet the Wholesale Market Objectives, it is important that competition develops in both the generation sector and the retail sector. In this regard, the market has made positive steps in the right direction.

First, in the generation sector, a number of new generation participants have entered the market. There has also been an increase in the number of generators with significant facilities that have been assigned Capacity Credits.

Figure 27 sets outs Capacity Credits assigned to generators in each Capacity Year since market commencement. In the 2006/07 Capacity Year, Verve Energy accounted for 77 per cent of all Capacity Credits assigned. By the 2011/12 Capacity Year, this will fall to 57 per cent of all Capacity Credits. This is the result not only of the entry of substantial new generators – both NewGen and Griffin Power will have two large power stations in the WEM by the 2011/12 Capacity Year – but also an increase in the Capacity Credits accounted for by smaller independent generators. The Authority considers that both of these are signs of the evolution of a competitive generation sector.

Importantly, the Authority also notes that investment in the generation sector since market commencement has consisted of, and will continue to consist of, generation plant of a range of different technologies and fuel types entering the market. By the 2011/12 Capacity Year, the market will have seen Capacity Credits assigned to developments of new coal, gas, wind, biomass and waste gas generation plant, as well as Demand Side Management (**DSM**).

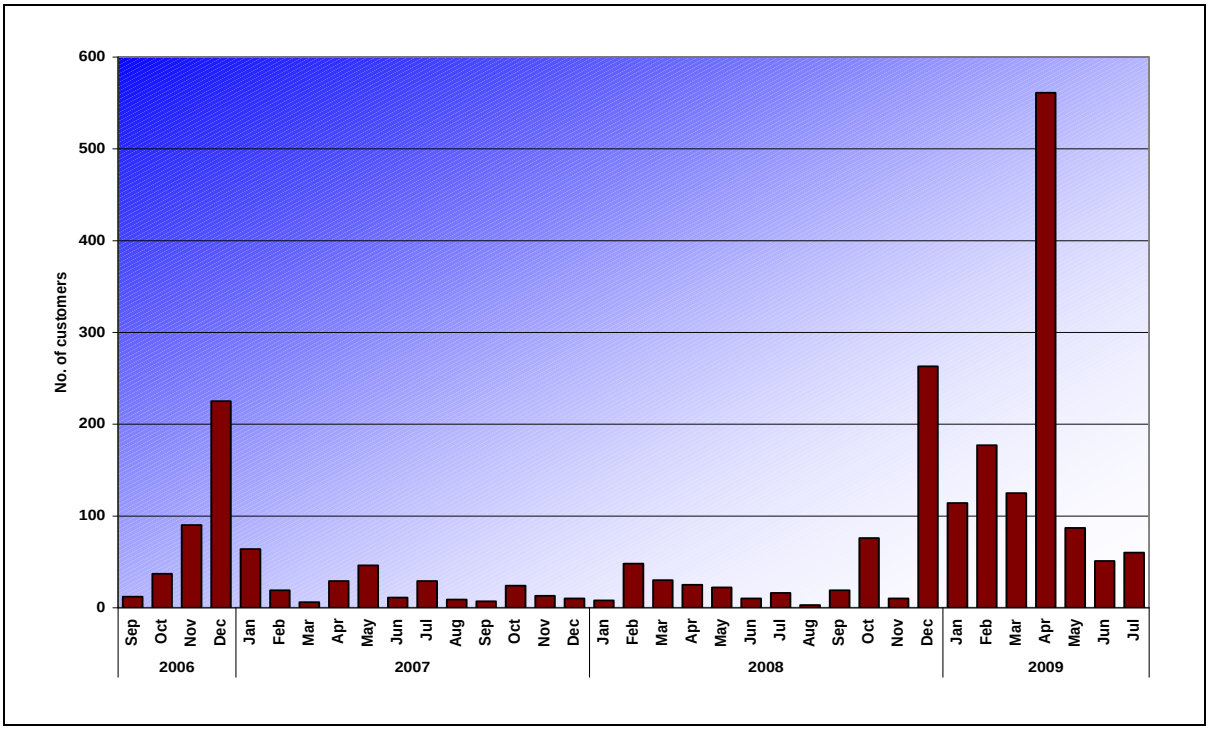
Figure 27 Capacity credits assigned



The increasing competitiveness of the generation sector is also reflected in other outcomes in the market. The 2008/09 Capacity Year saw the entry of both NewGen's first power station and Griffin Power's first power station. This resulted in a significant increase in volumes traded in the STEM, with both NewGen and Griffin Power actively trading in the STEM. It is unclear whether the increase in STEM volumes related to these new plants will be sustained, but it does seem clear that the STEM is important to new generators as they commission power stations and enter the market. The 2008/09 Capacity Year also saw an increase in bilateral quantities traded between participants other than directly between Verve Energy and Synergy. On the whole, this indicates that as the generation sector becomes more competitive, there should be an increase in the competitiveness and liquidity of bilateral markets and the STEM.

Second, in the retail sector, the evidence suggests that the competitiveness of the retail market is increasing. Figure 28 sets out the rate at which customers have switched, or 'churned', between retailers since market commencement. The rate at which customers have churned increased significantly in late 2008 and during 2009, reaching a peak in April 2009. Since then customer churn rates have returned to lower levels, although switching is still occurring more frequently than during the bulk of 2007 and 2008. The Authority also notes that a particular Market Customer has recently commenced actively retailing in the market. While the lack of FRC in Western Australia imposes a limit on the extent to which retail competition can develop, there are nevertheless clear signs of the evolution of a competitive retail sector.

Figure 28 Customer churn[53]



The Authority also considers that price outcomes in the STEM to date have been encouraging. Clearly, the most significant impact on STEM price outcomes since market commencement has been the extended period of gas shortages following the Varanus Island incident. These gas shortages resulted in substantial and prolonged increases in STEM Clearing Prices, in both peak and off-peak periods. As gas supplies were gradually restored, STEM Clearing Prices have returned to more normal levels. STEM Clearing Prices are now at or below levels observed prior to the Varanus Island incident and, over the last few months, have been at low levels rarely seen since market commencement. The volatility of STEM Clearing Prices has also decreased since the Varanus Island incident.

The Authority also notes that STEM Clearing Prices continue to provide useful signals by responding to fuel scarcity. Prices tend to be lower during off-peak periods than peak periods and, most obviously, were substantially higher during gas scarcity resulting from the Varanus Island incident. As with the STEM, outcomes in the Balancing market indicate that Balancing prices provide useful signals by responding to scarcity.

The Balancing market has yet to be opened to competition. Outcomes in the market to date indicate that a range of facilities have capacity available, and that the potential capacity available to Balancing is increasing in line with the new entry in the generation sector. However, it is unclear whether this capacity could be used to provide Balancing at this stage because of the standards required for the provision of Balancing services. It is also apparent that standing Balancing prices bid by Market Participants are, for the most part, at levels close to or at the Energy Price Limits.

[53] Customer churn is measured by the number of National Meter Identifiers (NMIs) transferred between retailers.

Finding 1

Section 4.1

On the whole, the Authority considers that the Wholesale Electricity Market has operated effectively since market commencement, and that outcomes in the market are responding to an increase in competition in both the generation sector and (to a lesser extent) the retail sector. The Authority considers that these are positive signs for the evolution of the market. Nevertheless, the Authority notes that the market remains concentrated and that there are a number of ongoing issues highlighted in this report that the Authority believes need to be addressed in order for the market to more effectively meet its objectives.

4.2 Stakeholder's comments on the Wholesale Market Objectives

4.2.1 Outline in the Discussion Paper

As well as inviting comment on the extent to which stakeholders considered that the WEM is effective in meeting the Wholesale Market Objectives, the Discussion Paper also invited comment on whether the Wholesale Market Objectives are appropriate.

4.2.2 Submissions in response to the Discussion Paper

In regard to the appropriateness of the Wholesale Market Objectives, most stakeholders were generally supportive of the existing objectives.[54]

However, some stakeholders considered that greater clarity regarding the Wholesale Market Objectives could be achieved in the following areas.

- Having multiple Wholesale Market Objectives increases the risk of conflict between specific objectives – such as between reliability and efficiency. One stakeholder commented that it may be time to develop a single over-arching market objective that focuses on economic efficiency.[55]
- In light of the likely increased future penetration of renewable energy options, more guidance could be provided as to the correct interpretation of the Wholesale Market Objective of avoiding discrimination against particular energy options. One stakeholder noted that renewable energy has benefited from the allocation of Capacity Credits beyond its actual contribution to system capacity, and it is unclear that this is consistent with the Wholesale Market Objectives.[56] This stakeholder also noted that this issue is being addressed through the REGWG.[57]

[54] Alinta, Infratil, System management, IMO.

[55] Synergy.

[56] Landfill Gas and Power.

[57] IMO, *Renewable Energy Working Group* http://www.imowa.com.au/n139

4.2.3 Authority's view

Although the Authority is of the view that the WEM has been meeting the Wholesale Market Objectives, there may be opportunities to increase the clarity of the Wholesale Market Objectives, in order to simplify the evaluation of the market's development and performance in the future. These opportunities for increased clarity include:

- providing greater guidance around the application of the market objectives in practice, such as objective (c) regarding non-discrimination between different energy types; or
- rationalising and replacing the existing Wholesale Market Objectives with an overarching market objective based on competition and economic efficiency that takes account of price, quality, reliability, security and safety, similar to the national electricity objective in the *National Electricity Law* (**NEL**).

Either of these options could be used to signal to the market that the need to avoid discrimination in energy options and technologies and to promote DSM is desirable only in so far as it promotes competition and efficiency. In the Authority's view, the Market Rules should not extend non-discrimination to the point where it could lead to inefficiency or harm competition. This issue is likely to become more significant as the penetration of intermittent wind plant increases in Western Australia. At the same time, the Authority notes that rationalising the Wholesale Market Objectives along the lines of the national electricity objective in the NEL would not, as suggested by some stakeholders, overcome potential conflicts between efficiency and reliability goals. That would require the adoption of a 'probabilistic' approach to reliability,[58] a prospect that seems some way off in Western Australia. In any case, amending the Wholesale Market Objectives, or indeed, the objectives of any reform process, is the role and prerogative of the responsible policy-makers.

The Authority proposes that a WEM Future Strategy be coordinated by the Office of Energy to systematically examine a number of market design issues in the WEM. The Authority believes that the proposed WEM Future Strategy would also be the appropriate forum for considering whether it would be worthwhile to amend the Wholesale Market Objectives to facilitate clearer assessment of the market's performance and future development.

Recommendation 2

Section 4.2.3

The Authority considers that clarity of the Wholesale Market Objectives is crucial to ensuring that the ongoing evolution of the market is appropriate.

The Authority recommends that the proposed WEM Future Strategy should consider whether there are benefits to amending the Wholesale Market Objectives to improve their clarity. This may facilitate clearer assessment of the market's performance and future development.

[58] A probabilistic approach to reliability is one in which the value of reliability is quantified and compared to other measureable economic benefits. This approach to reliability has been adopted by VENCorp, the responsible network planning organisation in Victoria.

4.3 Network connection and planning issues

A number of issues related to network planning and network connection were raised by stakeholders and discussed in the Authority's Discussion Paper. These included:

- network connection applications and delivery;
- capital contributions for shared network assets (also known as 'deep connection charges'); and
- network planning.

Each of these issues is discussed in this section.

4.3.1 Network connection applications

4.3.1.1 Outline in the Discussion Paper

The Discussion Paper noted the interaction between the RCM and network access. In particular, the Market Rules require that an application for certification of Reserve Capacity for a facility that has not yet entered service must include a network access offer from Western Power Networks that shows that the facility is entitled to network access.

Some stakeholders have raised concerns about the time taken to receive a network access offer from Western Power Networks, and suggested that delays in receiving a network access offer can delay participation in the RCM and thereby lead to delays in generation investment more generally.

The Discussion Paper referred to an EMCa report for the AEMC Climate Change Report, which suggested a range of potential solutions to delays in the network connection application process. These included the commitment of additional resources by Western Power Networks to the assessment process, improving the availability of market information and a number of modifications to Western Power Networks' policy for queuing applications for network access including:

- geographically segregating the queuing process;
- requiring a high-level feasibility study to be undertaken before an application can progress beyond a certain point in the queue; and
- greater cost-reflectivity of access application charges (to reflect the expected costs of required system studies) and the charging of annual administration fees to deter potential applicants with marginally committed projects from entering the queue until they are closer to commitment.

4.3.1.2 AEMC Climate Change Report

The AEMC Climate Change Report suggested that the existing WEM arrangements for network connection would be tested by the expanded RET. In particular, the expanded RET is expected to lead to a significant increase in renewable generation, principally wind, and these plant will tend to be smaller as well as more numerous and geographically dispersed than conventional generators. The AEMC considered that the growth of wind generation is likely to require significant network investment for connection purposes. Given the lower capacity factors of wind plant combined with the nature of existing

planning standards, this could lead to inefficient over-investment in the transmission network.[59]

To address these issues, the AEMC made a number of recommendations.[60] These included:

- reassessment of the entire basis for generator access to the network, including allowing for non-firm generator connection, relaxing the N-1 planning standard and adopting a more dynamic approach to line ratings (discussed in more detail in Section 4.3.4);
- modification of the connections application process through the release of more information to the market (including queue information) and potentially the segregation of applications in the connections queue on a regional basis;
- a formal regime for coordinating multiple connection applications, which could be informed by the AEMC's Scale Efficient Network Extensions proposal or Western Power Network's 'Generation Parks' proposal;
- a review of the Regulatory Test and New Facilities Investment Test (**NFIT**) with regards to their clarity and workability as they relate to new generation projects (discussed in more detail in Section 4.3.4); and
- a review of the charging regime for network augmentations, to be led by Western Power Networks, incorporating the options of modifying Western Power Networks' Capital Contributions Policy and charging all new generators on a common basis through published connection offers (discussed in more detail in Section 4.3.4).

4.3.1.3 Submissions in response to the Discussion Paper

General Comments

A number of stakeholders commented that long network access lead times may be an impediment to efficient generation investment, particularly to the extent that access delays can in turn delay participation in the RCM.[61] Therefore, any improvements to streamline the network access application process would be beneficial.[62] It could also be worthwhile for Western Power Networks to expand its planning team, increase its use of consultants and provide a timetable to applicants for the processes it needs to undertake to assess a network connection application.[63]

Western Power Networks commented that issues with the management of the network application queue are emerging as an issue for the availability of generation capacity. However, Western Power Networks commented that applicants seeking a network access offer in time for their proposed connection schedule should join the access queue at an early stage.

Bond

The Discussion Paper asked for comment on whether it would be appropriate for Western Power Networks to require that a bond be lodged with an application for network access.

[59] AEMC Climate Change Report, p.139.

[60] AEMC Climate Change Report, pp.143-148.

[61] ESAA, Extension Hill, Landfill Gas and Power, Perth Energy, Synergy.

[62] IMO, Infratil.

[63] Perth Energy.

Most stakeholder submissions supported the requirement of a bond as evidence of a proponent's seriousness about a project, so long as it was not so large as to constitute an unreasonable barrier to entry.[64]

Management of the queue

A number of stakeholders commented on amendments to the Application and Queuing Policy (**AQP**), particularly the possibility of Western Power implementing some criteria for placing network connection applications in the queue.

In order to streamline the queuing regime, most stakeholders supported a modification or review of the existing AQP to provide Western Power Networks with the ability to discriminate between network access applications in a transparent and objective manner.[65] However, one stakeholder stated a preference for relying on a bond for distinguishing between serious and less serious projects, given that any criteria were likely to be ambiguous or subjective.[66]

4.3.1.4 Western Power Networks' proposed amendments to the Applications and Queuing Policy

In response to the Authority's Discussion Paper, Western Power Networks commented that long regulatory processes[67] and the network connection application process create a substantial impediment to fast-tracking new generation developments, including renewable generation. Western Power Networks raised the following issues:

- processing times, 'speculative' network connection applications and incentives under the current 'first-come, first-serve' process, can result in delays to the processing of network connection applications;
- the unconstrained network planning model (discussed in more detail in Section 4.3.4) requires that Western Power Networks consider all reasonable contingency events (regardless of duration or probability) when modelling the impact of new generation projects on the network;
- maintaining confidentiality of network connection applications and their associated works may prevent Western Power Networks from being able to optimise augmentation scenarios by forming a combined approach; and
- further transparency of the length of the queue would also provide a clearer signal to applicants as to available capacity and amount of competition.

Western Power Networks noted that it is currently in the process of developing proposed amendments to the AQP outside of the Access Arrangement revisions process. Western Power Network's proposed amendments to the AQP aim to reduce the average connection application processing time and to ensure projects are prioritised on a more

[64] Alinta, Synergy, IMO, Infratil, Perth Energy, Verve Energy.

[65] Alinta, ESAA, Synergy, IMO, Infratil, Verve Energy.

[66] Perth Energy.

[67] Subsequent to Western Power Network's submission in response to the Authority's Discussion Paper, it clarified that the regulatory process referred to in its submission is in respect of the planning and development approvals required for the completion of network projects, specifically transmission network augmentation projects, including the economic regulatory processes set out in the Access Code; namely: the Regulatory Test (an Authority determination is required within 45 business days if public consultation is undertaken, otherwise within 25 business days) and the New Facilities Investment Test (an Authority determination is required within approximately 130 days, which assumes all steps of the public consultation process are followed and the maximum amount of time is utilised from the time of publication of an invitation for first round public submissions).

appropriate basis. Western Power Networks noted that it intends to submit the following changes to the AQP to the Authority in early 2010.[68]

- A compulsory enquiry phase, as in the NEM, during which Western Power Networks and applicants discuss project requirements in depth, thereby assisting applicants in their decision making process.
- A proposal to make conditional offers to all applicants that are subject to a queue constraint and that prioritisation will only be based upon lodgement criteria in the event that the conditional offers are oversubscribed.
- A 'bypass' process for enabling applications in the queue to be reprioritised. The current AQP also has a bypass process, but the role of bypass under the new AQP is expected to be smaller due to the greater scrutiny of applications at the enquiry phase.

4.3.1.5 Review of Recommendations and Findings from the 2008 Minister's Report

The 2008 Minister's Report included a detailed discussion of the issues arising from the network connection applications process. While recognising that broader network planning and coordination issues needed to be addressed, the Authority made several recommendations specifically directed towards improving the network connection applications process. In brief, these were as follows:

- Western Power Networks should address its processes and resourcing constraints for assessing network connection applications;
- Western Power Networks should provide greater transparency around its processes for dealing with network connections applications, as well as the status of applications within the queue (subject to commercial confidentiality concerns); and
- Western Power Networks should examine the scope for providing more detailed information on network capacity and constraints, beyond what is contained in the Annual Planning Report.

4.3.1.6 Authority's view

The Authority notes that in their responses to the Discussion Paper, stakeholders offered broad support for changes to the AQP that would enable Western Power Networks to assess the level of readiness of an applicant's project and would require a monetary bond prior to admission to a network connection queue.

The Authority has assessed Western Power Networks' proposed revisions to its Access Arrangement for the South West Interconnected Network (**SWIN**), and the Authority notes that Western Power Networks is pursuing a more substantial review to the AQP as described in Section 4.3.1.4. The Authority understands that Western Power Networks has engaged in a comprehensive consultation process with affected parties and intends to submit its proposed revised AQP to the Authority by early in 2010. It is anticipated that Western Power Networks will make a submission under the provisions of the *Electricity Networks Access Code 2004* (**Access Code**), which allows for revisions to an access arrangement during an access arrangement period.[69] If this is the case, the Authority's

[68] Western Power Networks, *Discussion Paper: Proposal for changes to the Application and Queuing Policy*, 17 August 2009.

[69] Sections 4.41A to 4.45 of the Access Code.

consideration of Western Power Networks' proposed revised AQP will be in accordance with these provisions.

Finding 2

Section 4.3.1

In order to be eligible to receive Capacity Credits,

the Market Rules require that a new facility has a network access offer. As a result, the process for receiving a network access offer can have a significant impact on investment in the Wholesale Electricity Market.

A number of issues with the process for receiving a network access offer have been raised by stakeholders. Western Power Networks is reviewing its Application and Queuing Policy, with the intention of proposing revisions to reduce the average connection application processing time and to ensure projects are prioritised on an appropriate basis.

The Authority considers that Western Power Networks' process is the appropriate procedure for addressing issues with network access offers. The Authority supports Western Power Networks' intention to submit amendments, and expects to review these amendments under the *Electricity Networks Access Code 2004*.

4.3.2 Network connection delivery

In the 2008 Minister's Report, the Authority made a recommendation that liquidated damages payments should be incorporated into arrangements for delivery of network connections by Western Power Networks.[70]

This recommendation was not commented upon by stakeholders participating in the consultation undertaken by the Authority prior to the release of the Discussion Paper, nor in submissions to the Discussion Paper other than the submission from Western Power Networks. However, one participant did comment that Western Power Networks was unwilling to accept the cost of scheduling risk arising from delayed network access offers.

Western Power Networks' response to the issue of liquidated damages was that such a provision was inappropriate and would require an adjustment to Western Power Networks' regulated revenue. Upon further consideration, the Authority has come to the view that provision for liquidated damages should be a matter for commercial negotiation between Western Power Networks and the connecting participant in relation to the terms of its connection agreement.

One concern raised by Western Power Networks is that even if this were the case, any additional charges imposed by Western Power Networks to reflect the risk of having to pay liquidated damages would fall under its revenue cap. Therefore, Western Power Networks may not be entitled to retain any additional revenue earned by taking on this risk. Under the Authority's Further Final Decision on Western Power Networks' proposed

[70] 2008 Minister's Report, p.50.

revisions to the Access Arrangement, construction of connection assets is provided by Western Power Networks as a non-reference service for which the terms and charges are determined by negotiation between a user and Western Power Networks. To the extent that a liability of Western Power Networks for liquidated damages forms part of the terms of the construction of connection assets, any additional charge to be paid for the provision of this service, and any additional revenue received by Western Power Networks, falls outside of Western Power Network's revenue cap.

4.3.3 Deep connection charges

4.3.3.1 Outline in the Discussion Paper

The Discussion Paper raised two issues related to the requirement for applicants for network connection to make capital contributions for any required augmentation to shared network assets, also known as 'deep connection charges'.

First, the Discussion Paper noted that deep connection charges could vary depending on the order in which an applicant's network access application is dealt with by Western Power Networks.

Second, the Discussion Paper noted that one stakeholder had contended that Western Power Networks tended not to apply the NFIT to new generation-driven network investment. This meant that new generators connecting to the network were often required to pay deep connection charges in respect of transmission investments that ought to be rolled into Western Power Network's capital base. This was despite the fact that Western Power Networks is generally required to assess network investments against the requirements of the NFIT under the Access Code, and the NFIT is capable of estimating the full benefits of generation-driven transmission investments if applied appropriately. In response, Western Power Networks confirmed that it does apply the NFIT to generation-driven transmission investments, but that the appropriate means of applying the NFIT to generation-led projects remains somewhat uncertain, which led to Western Power Networks adopting a conservative approach to estimating the market benefits of network augmentations. This approach was motivated by increasing network transfer capability and reducing the cost of serving load.[71]

4.3.3.2 AEMC Climate Change Report

The AEMC Climate Change Report identified a number of options for modifications to Western Power Network's Capital Contributions Policy.

First, the AEMC suggested reviewing the existing Capital Contributions Policy, to improve clarity and predictability. Second, the AEMC suggested giving consideration to charging new generators on the basis of published deep connection charges instead of offer-specific capital contributions requirements. This would help smooth the recovery of costs for 'lumpy' network investments.

[71] The NFIT is set out in Clause 6.52 of the Access Code. One of the requirements for an investment to satisfy the NFIT is that it is either expected to generate incremental revenues that exceed its costs or that it will provide a "net benefit" sufficient to justify the imposition of higher tariffs (see Clause 6.52(b)(ii)). "Net benefit" is defined as meaning a net benefit in present value terms to those who generate, transport and consume electricity in the market. This expression is similar to the term used in the Australian Energy Regulator's Regulatory Test, used in the NEM. It requires market modelling to estimate the impact of a transmission investment on patterns of dispatch and hence on the resource costs of meeting electricity demand. While the concept of net benefit is now well understood in the NEM, few transmission businesses have applied this means for justifying transmission investment, preferring to rely on the more technical 'reliability limb' of the Regulatory Test. This is similar to Clause 6.52(b)(iii) of the Access Code.

The AEMC also noted that a more fundamental change would be the implementation of a locational transmission use of system (TUoS) charge to generators – which could reduce or eliminate reliance on deep connection charges altogether – and/or introduction of a system of locational Capacity Credits in the Reserve Capacity Mechanism.[72]

4.3.3.3 Submissions in response to the Discussion Paper

Several stakeholders commented in favour of a move away from the existing deep connection charging approach towards a shallow charging approach used in some other jurisdictions, such as the NEM. Comments on connection charging included the following:

- Western Power Networks' approach to determining deep connection charges, in conjunction with the AQP, may distort generation entry decisions, create barriers to entry in markets upstream and downstream of the network, and have negative impacts on competition in those markets. The Wholesale Market Objectives would be better met if Western Power's Capital Contributions Policy adopted a shallow connection charge approach.[73]
- Developers should not face deep connection charges when installing new capacity to meet a system load increase from higher customer demand generally. Rather, the costs of upgrades should be rolled into Western Power's general system charges and allocated to all users.[74]
- Capital contributions should be required only when an application does not comply with the current network development plan.[75]

4.3.3.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority recommended that Western Power Networks should formalise and publish its methodology for setting deep connection charges as soon as possible. This would assist participants in estimating the size of their connection charges and make their connection application decisions accordingly.[76]

The Authority also noted that the approach to connection charges is closely related to the present 'unconstrained' approach to network planning in the WEM. This is discussed in more detail below in Section 4.3.3.5.

4.3.3.5 Authority's view

In the consultation undertaken for the 2009 Minister's Report, the Authority found that concerns about lack of transparency regarding deep connection charges did not arise to the same extent as in previous years. This may be because stakeholders were aware that transparency issues were being considered as part of the Authority's review of Western Power Networks' proposed revisions to its Access Arrangement. In this review, the Authority decided to require Western Power Networks to amend its proposed Capital Contribution Policy to include an obligation on Western Power Networks to provide an applicant or user with details of the calculation of any required contribution. Western Power Networks has agreed to this requirement.

[72] AEMC Climate Change Report, pp.147-148.

[73] Alinta.

[74] Perth Energy.

[75] Synergy.

[76] 2008 Minister's Report, p.53.

Regarding the issue of deep connection charges depending on the order in which an applicants' network access application is dealt with by Western Power Networks, the Authority notes that this is also an issue for network operators in other jurisdictions. Some network operators adopt a reimbursement arrangement, whereby the original applicant would be reimbursed for a share of the deep connection charges it faces as subsequent access applicants are connected. Western Power Networks uses a similar scheme in Distribution Networks. However, this arrangement requires significant record keeping and load flow analysis to determine the quantum of reimbursement each time a new access applicant is considered to benefit from the network augmentation required by the original applicant.

A more wide-ranging reform would be a move away from deep connection charges. The key concerns expressed by stakeholders in the consultation process focussed on both the competition and efficiency implications of charging new generators for the costs required for augmentation to shared network assets, in circumstances where generation investment was efficient and motivated by rising customer demand. In these circumstances, a number of participants considered that the existing approach would deter efficient new generation and proposed the adoption of a 'shallow' connection charging approach, as adopted in the NEM and various other markets around the world. Under such an approach, new generators are only required to pay for the direct costs of infrastructure required to connect their plant to the existing transmission system and not the costs of downstream augmentations needed to ensure that their power can reach major load centres.

The Authority notes that under a shallow connection charging regime, arrangements would need to be implemented to allocate responsibility for funding the costs of required downstream augmentations that are presently recovered through deep connection charges. For example, the costs of such downstream augmentations could be 'smeared' across all network customers.

Alternatively, the unconstrained network planning approach could be relaxed so that the connection of new generators to the power system does not automatically trigger the need for downstream network augmentation and the attendant need to recover downstream augmentation costs. However, a relaxation of the unconstrained network planning approach would have implications for the current design of the market, as discussed in Section 4.3.4.

Because of the potential interdependencies between the connection charging approach and the network planning approach, the Authority considers that examination of a shallow connection charging approach should occur within the context of a broader review of network planning undertaken pursuant to the proposed WEM Future Strategy process (see below).

Recommendation 3

Section 4.3.3

Applicants for network access may be required to make capital contributions for augmentation to the shared network. The arrangements for determining these capital contributions, known as 'deep connection charges', can have a significant impact on investment in the Wholesale Electricity Market.

A number of issues with deep connection charges have been raised by stakeholders.

The Authority recommends that the appropriate approach for deep connection charges be considered as part of changes to the network planning approach, dealt with through the WEM Future Strategy. The Authority considers that this would facilitate decisions that reflect the inter-relationships between deep connection charges and the network planning approach.

4.3.4 Network planning

4.3.4.1 Outline in the Discussion Paper

Under the existing 'unconstrained' network planning approach in use in the WEM, new generators can only be connected where their connection will not lead to transmission limits being exceeded.[77] As noted above in Section 4.3.3.5, the unconstrained planning approach naturally aligns with the use of deep connection charges to recover the costs of network investment required to prevent a new generator's output from overloading the network. If a shallow connection charging approach is adopted, responsibility needs to be allocated for funding the costs of network augmentations required to maintain an unconstrained network.

The Discussion Paper noted the drawbacks of continuing with the current unconstrained approach to network planning in the WEM, including potential inefficient over-investment in the grid. This was a particular concern in circumstances where the application of the unconstrained planning approach is applied to intermittent generation that does not always operate at full capacity at peak demand times. This could lead to substantial under-utilisation of new network assets, which would be contrary to the Wholesale Market Objectives. The Authority invited comment on options for promoting efficiency in network planning and investment that are consistent with the RCM.

4.3.4.2 AEMC Climate Change Report

The AEMC Climate Change Report criticised the unconstrained network planning approach as likely to lead to inefficient over-investment in transmission. As noted above, the AEMC proposed allowing for generator connection on a non-firm or 'potentially constrained' basis.[78] However, the AEMC noted that facilitating connections on this basis would have implications for System Management's processes, Balancing and the RCM.

[77] More precisely, the unconstrained approach requires that a new connection will not lead to network ratings or allocated power transfer capacity being exceeded under the worst credible load and generation patterns and the most critical credible contingency events. See Technical Rules 2.3.7.1(a).

[78] AEMC Climate Change Report, pp.121-123.

For example, a network model with constraint equations would be necessary to enable dispatch, as in the NEM. In Balancing, it may be necessary to review the deviation charges that apply to generators whose outputs are constrained below their contracted quantities. Presently, as discussed in Section 3.4.1.2, such deviation charges embody a penalty to deviating non-Verve Energy Scheduled Generators. It may also be appropriate to consider locational elements to such charges, to ensure they reflected the costs of congestion. Finally, the scope for a new class of constrained generators would require modification to the RCM so that such generators could not sell as many Capacity Credits as other generators. The AEMC observed that the introduction of constrained generators would logically accompany a relaxation of planning standards. According to the AEMC, while the costs of making these changes would be material, the benefits could be very significant.

4.3.4.3 Submissions in response to the Discussion Paper

Efficient planning in an unconstrained context

A number of stakeholders supported policies to improve coordination between network development and new generation investment.[79] This could involve explicit consideration of 'strategic considerations' such as fuel and geographic diversity,[80] as well as the creation of 'generation parks' or a transmission headworks scheme.[81]

Some of these stakeholders considered that it was appropriate for Western Power Networks to take a stronger lead in determining the location and timing of network augmentation,[82] others were in favour of network planning being transferred to an independent agency.[83]

Constrained network

Western Power Networks commented that although it generally seeks to achieve an unconstrained network, in areas in which the network is capacity constrained – such as in the Goldfields – the unconstrained assumption inherent in a system-wide STEM price is inappropriate.

Multiple stakeholders supported examination of a move to a constrained network planning approach.[84] However, even those in favour of considering constrained planning noted that such a move would have significant implications for the market in terms of managing the dispatch process, operating the RCM and the imposition of deviation charges.[85]

The IMO contended that an unconstrained network model appears appropriate at present, but noted that it may not, over the long term, optimise the overall cost of delivering electricity. For this reason, the IMO commented that at some point it may be appropriate to consider a multi-nodal market design.[86]

[79] Extension Hill, Western Power Networks, Perth Energy.

[80] Extension Hill.

[81] Western Power Networks.

[82] Perth Energy.

[83] Synergy.

[84] Alinta, Landfill Gas and Power, Synergy.

[85] For example, Synergy.

[86] In a nodal market, wholesale electricity prices are calculated for specific delivery points (called nodes) based on the demand, generation and transmission available to serve the local area.

System Management commented that adoption of a constrained network planning approach would complicate the process of running or 'dispatching' generators to meet demand.

4.3.4.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority expressed the view that it did not see its role as managing the coordination of network and generation investment to promote efficiency. Rather, more extensive and better quality information about the management of network connection applications and the availability of spare capacity and constraints in the network should promote more efficient investment decisions and outcomes.

The Authority also discussed the far-reaching implications of a shift away from the existing unconstrained approach to network planning. As a result, the Authority recommended that the approach to network planning should be considered as part of the proposed road map for development of the market.[87]

4.3.4.5 Authority's view

The Authority considers that a move from an unconstrained to a constrained network planning approach is a significant issue for the market. The Authority considers that there are considerable potential efficiencies in network investments available from a move – whether partial, as considered by the AEMC, or complete – to a constrained network approach. However, a move towards a constrained network approach – whether partial or complete – would have substantial implications for other market mechanisms. In particular, the Authority considers that a full move to a constrained network planning regime would require a wholesale rethinking of the current design of the WEM.

The Authority notes that the IMO has no responsibility or mandate for tackling issues relating to new network connections or network planning in the WEM. Therefore, the Authority considers that the proposed WEM Future Strategy process should be progressed and for the review of network planning to be a high priority for that process. The proposed WEM Future Strategy process would need to be cognisant of important interactions, such as those between network planning and the network connection process, the RCM and dispatch. It should also consider the merits of the AEMC's proposals and any reasonable alternatives identified through consultation and its own analysis.

The Authority supports the AEMC's recommendation that a full cost-benefit analysis of options for reform of the network planning approach be adopted. In terms of actually conducting the analysis of competing options, the Authority considers that Western Power Networks, System Management and the IMO should all have significant roles in advising the Office of Energy as to the implications of any move away from the existing network planning approach.

[87] 2008 Minister's Report, pp.54-55.

Recommendation 4

Section 4.3.4

The ability for a generator connecting to the electricity network to deliver its maximum generating capacity (i.e. 'unconstrained' or 'constrained' access) has significant implications for investments in the network and the operation of the power system.

The unconstrained network planning approach used in the Wholesale Electricity Market may lead to inefficient investment in network assets, increasing the cost of supplying electricity to customers.

The Authority recommends that the Independent Market Operator, the Office of Energy, System Management and Western Power Networks review network planning in the South West Interconnected System, focussing on the competing 'constrained' and 'unconstrained' planning frameworks. The Authority recommends that this review take place as part of the WEM Future Strategy.

4.4 Reserve Capacity Mechanism issues

A number of issues related to the RCM were raised by stakeholders and addressed in the Authority's Discussion Paper. These included the:

- timing of the RCM;
- incentives for investment by new generation;
- Reserve Capacity Price (**RCP**); and
- Reserve Capacity refund payments.

Each of these issues is discussed in this section.

4.4.1 Timing of the Reserve Capacity Mechanism

4.4.1.1 Outline in the Discussion Paper

As noted in the Discussion Paper, proponents of new power stations need to decide on appropriate investments based on a projection of load for a number of years in the future, for example, up to five to six years in the future for base load plant. Decisions about the appropriate type of plant to build (base load, mid-merit or peaking) will be based on judgements of many other factors, including the expected characteristics of load, the existing mix of generation plant, the costs of alternative technologies and the availability and cost of fuel.

With the RCM operating two years in advance of the relevant Capacity Year, it is assumed that proponents of longer lead time generation plant will have planned and possibly even part-built their plants before the relevant Reserve Capacity year. The longer lead time plants may seek to be conditionally certified earlier than two years in advance of commissioning. Therefore, the timing of the RCM does not preclude the longer lead time

generators from participating in the market, although it would be likely to impact on the risks faced by such generators.

4.4.1.2 Rule Change RC_2009_10 Early Certified Reserve Capacity

Rule Change Proposal RC_2009_10 *Early Certified Reserve Capacity*[88] proposed amendments to the timing of the RCM for new generation projects with long lead times. The Rule Change Proposal was made partly in response to the suggestion that financiers are unlikely to finance projects based solely on Conditional Certified Reserve Capacity (**CCRC**). CCRC may be obtained in advance, but does not guarantee that Capacity Credits will be subsequently assigned.

As part of Rule Change Proposal RC_2009_10, the IMO proposed to introduce a new concept of Early Certified Reserve Capacity (**ECRC**). ECRC, and subsequently assigned Capacity Credits, will be granted and made available for the applicable Capacity Year and will require no further application to the IMO. The IMO proposed that the criteria for being assigned ECRC will be in line with the criteria for being assigned Certified Reserve Capacity (**CRC**).

Rule Change Proposal RC_2009_10 was accepted by the IMO on15 September 2009 and will commence on 1 February 2010 in time for the next Reserve Capacity Cycle.

4.4.1.3 Submissions in response to the Discussion Paper

A number of stakeholders made submissions to the Authority regarding the Rule Change Proposal RC_2009_10 and its implications for the RCM. Alinta did not support the proposal on the basis that there was no evidence it was required, Perth Energy supported the availability of full certification of Capacity Credits earlier than two years ahead of the relevant Capacity Year, while Synergy supported extending the entire RCM timeframe beyond the existing two years.

4.4.1.4 Authority's view

The Authority considers that incremental changes to the RCM, such as those the subject of Rule Change Proposal RC_2009_10, are appropriately handled through the Rule change process. Further, the Authority notes that the timing for entry into the RCM is a matter raised by the IMO for consideration as part of the Market Rules Evolution Plan process.

4.4.2 Incentives for new generation

4.4.2.1 Outline in the Discussion Paper

The Discussion Paper noted that the RCM has so far successfully secured enough capacity to meet forecast requirements, with the number of Capacity Credits assigned to participants exceeding the Reserve Capacity Requirement for each Capacity Year. In addition, under the RCM there has been a significant increase in the Capacity Credits assigned to new entrants.

[88] See IMO web site, RC_2009_10 Early Certified Reserve Capacity, http://www.imowa.com.au/n249.html

4.4.2.2 Oates Report

The Oates Report highlighted various issues with the WEM arrangements and commented that in the near future, the SWIS will have capacity at least 10 per cent in excess of the IMO's capacity target.[89] Most of these issues relate to matters outside the RCM, such as the rapid displacement schedule in the Vesting Contract between Verve Energy and Synergy. The Oates Report also highlight the relatively low contribution of wind plant in meeting peak load relative to the capacity for which wind plant is accredited in the RCM.[90]

4.4.2.3 AEMC Climate Change Report

The AEMC Climate Change Report observed that most stakeholders shared the view that the RCM has ensured the availability of sufficient generation capacity in the WEM.[91] The AEMC went on to suggest that the RCM should also ensure that sufficient capacity would be provided in the longer term, subject to concerns regarding the current allocation of Capacity Credits to wind plant in excess of the expected contribution of wind plant to peak demand. However, the AEMC noted that this issue was before the REGWG and was likely to be addressed through that process.

As discussed above in section 4.3.3.2, the AEMC also highlighted the implications of changes to network planning and new connections arrangements for the design of the RCM – in particular, the extent to which certain 'potentially constrained' generators ought to be entitled to sell Capacity Credits.[92]

4.4.2.4 Submissions in response to the Discussion Paper

The Authority received a wide range of submissions on the appropriateness of generation investment signals in the WEM.

Some stakeholders broadly considered that the existing 'bundle' of signals from the RCM, the STEM and Bilateral Contracts were reasonable, while suggesting relatively minor changes to the RCM to modify the signals it provided.[93]

However, other stakeholders raised more fundamental concerns over the strength or direction of generation investment signals operating in the WEM. For example, Western Power Networks expressed concern about a disconnect between the RCM and the planning and regulatory approvals process to support network augmentation. Western Power Networks considered that because of this disconnect, the present regime does not provide signals that ensure the optimal technology mix or reliability of new plant. Rather, the current regime seems to be encouraging the growth of wind and gas peaking plant.

Verve Energy commented that while there is no evidence that the RCM is promoting an inefficient mix of new generation, there are nevertheless concerns that the combination of short run marginal cost (**SRMC**) bidding rules, price caps and the RCM payments may discourage the entry of mid-merit plant in the future. Nevertheless, Verve Energy commented that it considers the RCM is reasonable and that there is no need for large scale changes at this time.

[89] Oates Report, p.7.

[90] Oates Report, p.37.

[91] AEMC Climate Change Report, p.156.

[92] AEMC Climate Change Report, pp.143-144.

[93] Alinta, Landfill Gas and Power, Perth Energy, Synergy.

4.4.2.5 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority noted that the RCM was not the only aspect of the WEM arrangements designed to ensure the appropriate quantum and type of generation capacity.[94] Rather, the RCM was intended to work together with Bilateral Contracts, the STEM and Balancing to help incentivise the right mix and quantity of plant.

The 2008 Ministers' Report went on to highlight other issues that could act as barriers to entry to new generation capacity. These were the dominant role of Synergy in the retail market in effectively underwriting new generation investment, as well as the then-existing prospect of a merger between Synergy and Verve Energy. The Authority considered that the development of stronger retail competition – including a shift to more cost-reflective retail tariffs – would be likely to increase the incentive for base load plant construction. Conversely, the incentives for investment in new capacity would be significantly affected by a merger between Synergy and Verve Energy.[95]

4.4.2.6 Authority's view

The Authority considers that the observed generation plant mix and locational outcomes are the end result of physical, environmental and commercial factors that together influence the investment decisions of Market Participants.

As noted in the 2008 Minister's report, the signals for new generation investment provided by the WEM include not only the RCM, but Bilateral Contract prices, STEM and Balancing outcomes, and the role of deep connection charges. These are designed to work together to incentivise the right mix, timing and location of new generation capacity, and therefore should not be considered in isolation. For example, while the Maximum Reserve Capacity Price (**MRCP**) (discussed further in Section 4.4.3) operating in the RCM is based on the fixed costs of an open cycle gas turbine peaking plant, plant with higher fixed costs such as base load and mid-merit plant would be expected to earn prices in excess of their SRMCs through Bilateral Contracts and the STEM. It is the combination of these 'infra-marginal rents' earned from Bilateral Contracts and the STEM, with the prevailing price for Capacity Credits, that is intended to provide base load and mid-merit plant with the ability to recover their total costs and make a reasonable return on capital.

However, there are specific issues that suggest that some of the regulatory settings around one or other of the market components might need to be reviewed. One identified issue is the potential over-allocation of Capacity Credits to intermittent renewable plant that seldom operates at full capacity at peak demand times. This issue is currently being considered by the REGWG. Another issue that has been raised is the relatively short timeframe in the RCM. Rule Change RC_2009_10 (discussed in Section 4.4.1.2), providing for ECRC is intended to overcome this issue. Similarly reviews of such regulatory settings could help address concerns raised in the Oates Report regarding the emergence of excessive Reserve Capacity.

The Authority considers that based on the available evidence (as discussed in Section 4.9.1.1), the IMO-managed processes within the WEM are broadly operating in a manner to ensure that the WEM continues to promote efficient investment signals. Over time, changes to market or regulatory settings may be required to promote efficient outcomes. However, to date, the Authority considers that there is no evidence supporting

[94] 2008 Minister's Report, p.57.

[95] 2008 Minister's Report, p.58.

a fundamental breakdown in the integrity of the signals for new plant investment in the WEM.

In relation to generation investment decisions, a specific entity could take on a stronger coordinating role in an attempt to better match generation type, timing and locational outcomes with network development, fuel supplies and the pattern of load growth. Such generation and transmission planning scenarios could be considered by the Generation Outlook work under the Verve Review Implementation Coordination Committee. Such scenarios, together with the energy market prices and the RCM, will help investors and Networks in forming their individual decisions on plant and network investment. The planning scenarios could help to minimise the time lag in pricing signals. It will however be inappropriate for the Government to dictate those decisions. This would effectively be a move towards central planning. In the Authority's view, while central planning may in theory enable the maximisation of investment coordination and efficiency, it will also produce greater and more costly errors if the information relied upon by the planner is incomplete, or if its incentives are skewed, which is often the case in practice. Ultimately, all end users will bear the risk and costs of these errors.

Recommendation 5

Section 4.4.2

The Authority notes the Generation Outlook work taking place under the Verve Review Implementation Coordination Committee, which is focused on providing generation scenarios for efficient generation investment decisions.

However, the Authority strongly recommends that generation investment decisions should remain decentralised with Market Participants through the Independent Market Operator's process.

4.4.3 Reserve Capacity Price

4.4.3.1 Outline in the Discussion Paper

As noted in the Discussion Paper, some stakeholders have commented that as the Reserve Capacity Price is based on the cost of an open cycle gas turbine plant, the RCM would inadequately incentivise mid-merit plant (and possibly base load plant), which has higher fixed costs than open cycle gas turbine plant.

4.4.3.2 Oates Report

The Oates Report commented that the existing wholesale market arrangements may not necessarily lead to the timely addition of new capacity, in part because the price of new capacity is capped under the Market Rules.[96]

[96] Oates Report, p.36.

4.4.3.3 Submissions in response to the Discussion Paper

Several stakeholders questioned the adequacy of the current Reserve Capacity Price to promote efficient generation investment. One stakeholder commented that generation investors could not rely on a Reserve Capacity Auction occurring and therefore would only find investment worthwhile if the MRCP was lifted so that 85 per cent of the MRCP would be sufficient to recover the costs of a greenfield peaking generator (to take account of the fact that the Reserve Capacity Price is set at 85 per cent of the MRCP in cases where a Reserve Capacity Auction does not occur).[97] Another stakeholder commented that the existing methodology for setting Capacity Credit prices does not adequately compensate developers for the cost of network access.[98] This stakeholder also suggested that the volatility of the MRCP and the RCP from year to year creates risks that are difficult for management of peaking plant. One solution suggested by the same stakeholder would be to cap variations in the Reserve Capacity Price to 10 per cent each year.

4.4.3.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority noted comments from stakeholders suggesting that the Reserve Capacity Price was not sufficiently influenced by actual demand and supply conditions. This gave rise to issues in years in which a Reserve Capacity Auction was not run (which is every year in the market's history to date) because the Reserve Capacity Price is effectively an administered price (based on the MRCP) that is likely to be higher than would prevail if the price were market-determined. However, the Authority also noted that there appeared to be little stakeholder impetus for a change to a market-determined Reserve Capacity Price in the short term and in any case the Authority considered that it was too early to consider a move to a competitive Reserve Capacity Price in the absence of a coordinated strategy for future market development. The Authority suggested that the move to a market-determined price for Reserve Capacity could be an issue to be addressed through the road map for development of the market.

4.4.3.5 Authority's view

The Authority notes that sufficient capacity to meet the Reserve Capacity Requirement is continuing to be delivered through the RCM (as seen in Figure 35). In Section 4.4.2 it is noted that there are a host of signals for new generation investment operating in the WEM, one of which is the RCM. However, if it were decided that the current methodology for calculating the MRCP does not facilitate sufficient generation to meet the future Reserve Capacity Requirement, then there is provision in the Market Rules for the MRCP methodology to be reviewed by the IMO at least every five years and by the Authority during 2013.

On 29 January 2010, the Authority approved the proposed MRCP for the 2010 Reserve Capacity Cycle as recommended by the IMO. The Authority notes that comments were received from seven stakeholders in regards to the assumptions and calculation of input parameters through the public consultation process. This level of response was greater than previous MRCP reviews, and may indicate that the current methodology for calculating the MRCP, embodied in the Market Procedure, should be reviewed.

[97] Infratil.

[98] Perth Energy.

Recommendation 6

Section 4.4.3

The Authority notes that the Reserve Capacity Mechanism has continued to deliver sufficient capacity to the Wholesale Electricity Market.

However, a number of stakeholders have commented on the assumptions and calculations used to determine the Maximum Reserve Capacity Price for the 2010 Reserve Capacity Cycle.

Given this, the Authority recommends that the Independent Market Operator exercises its option to bring forward the review of the methodology for calculating the Maximum Reserve Capacity Price (as set out in Clause 4.16.9 of the Market Rules) prior to its review of the Maximum Reserve Capacity Price for the 2011 Reserve Capacity Cycle.

4.4.4 Reserve Capacity refund payments

4.4.4.1 Outline in the Discussion Paper

Under the Market Rules, providers of Capacity Credits who fail to deliver capacity are required to pay a pre-determined refund in respect of the non-delivered capacity. The size of the refund is presently differentiated on the basis of the time of day and year when the capacity is not made available. The refund levels are set out in the refund table in Clause 4.26.1 of the Market Rules, and are effectively based on the assumption that more capacity is required during the peak hours and the hot season, and the rates of refund are higher at those times.

The Discussion Paper noted that some stakeholders questioned the appropriateness of the current refund arrangements, particularly in circumstances where there is adequate system capacity to meet demand and there is no threat of curtailment.

In the Discussion Paper, the Authority acknowledged stakeholders' views that there may be merit in a mechanism that more closely aligns the magnitude of refunds with the associated market impact of the non-delivered capacity.

4.4.4.2 Oates Report

The Oates Report raised concerns about the strength of the signals for new capacity in the RCM. In particular, the report contended that the refund penalties imposed on participants (who fail to provide capacity in accordance with their obligations arising from their allocation of Capacity Credits) are capped and thus provide general (rather than specific) incentives for capacity to be available.[99]

4.4.4.3 Submissions in response to the Discussion Paper

Stakeholder submissions varied on the merits of adjusting Reserve Capacity refund payments on the basis of market conditions, rather than the refund table in Clause 4.26.1 of the Market Rules. One participant supported the continuation of the current approach

[99] Oates Report, p.36.

of basing refunds on the table,[100] while another supported setting refund payments on the basis of the marginal cost of impacts on the market. One participant supported reviewing the Reserve Capacity refund mechanism through the road map process.[101]

System Management commented that basing Reserve Capacity refund payments on the available reserve margin, instead of a calendar approach, would better promote the Wholesale Market Objectives.

The IMO commented that Reserve Capacity refund payments have been reviewed a number of times since market commencement.

4.4.4.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority observed that the Reserve Capacity refund mechanism appeared to be working as intended and that any changes should be capable of being managed through the Rule change process.[102]

4.4.4.5 Authority's view

The Authority understands that different stakeholders have different views on the extent to which Reserve Capacity refunds ought to reflect the value of capacity being unavailable at the time at which it is required. Some consider that the value of the refund should be determined after the event to closely reflect the market condition at that time, while others consider it appropriate to retain the existing refund table. In this sense, the issue of the determination of the quantum of Reserve Capacity refunds is similar to the issue of the degree to which the price for Reserve Capacity Credits is market-determined. In both cases, there is a trade-off between prices (or refunds) more closely reflecting prevailing demand and supply conditions and prices (or refunds) reflecting the value of price certainty for investors.

To date the Authority is not aware of the RCM, under the existing arrangements, failing to incentivise participants to make reliable capacity available when it has been needed. The Reserve Capacity refund payments will be reviewed in the IMO's Market Rules Evolution Plan. The Authority considers that the treatment of Reserve Capacity refund payments can appropriately be dealt with through this process, and at this stage the Authority does not consider that there is a need for further strategic or policy guidance to the IMO on this matter.

4.5 Locational signals to generation investment

4.5.1 Outline in the Discussion Paper

The Discussion Paper noted that the locational decisions of new generators can require significant augmentation of the shared network. This is typically reflected in the capital contribution paid by the connecting generator, which is a form of locational price signal. The Discussion Paper noted that this appeared to be a matter for the access regime rather than the Market Rules, but invited comment on any concerns in respect of locational signals to new generation.

[100] Alinta.

[101] Verve Energy.

[102] 2008 Minister's Report, p.61.

4.5.2 Submissions in response to the Discussion Paper

Several participants commented that locational price signals are provided by the capital contributions policy and transmission loss factors but not by the RCM.[103] One stakeholder supported adjusting Reserve Capacity Prices by loss factors, bringing the treatment of capacity in line with the treatment of energy.[104] Other options proposed were the introduction of regional STEM Clearing Prices[105] or differing Capacity Credits related to network location.[106]

4.5.3 Authority's view

The Authority notes that stakeholders have differing views on the extent to which investors in new generation face appropriate locational signals. Most stakeholders acknowledge that the pricing of 'network access offers' provided some locational signals, but that the RCM presently does not. In the Authority's view, the issue is whether the existing locational signals in the WEM arrangements are adequate or whether additional signals (such as a locational Reserve Capacity Price) are needed. Given the complex interactions between various locational signals (provided by the market and more broadly), and that a number of the mechanisms delivering these locational signals, including the RCM and the network planning process, are proposed for review under the WEM Future Strategy process, the Authority considers that the adequacy of existing locational signals to generation investment should be addressed through the proposed WEM Future Strategy process. The Authority recommends that the formerly-active Generation Location Working Group should be re-established to consider this issue under the auspices of the proposed WEM Future Strategy process.

Recommendation 7

Section 4.5.3

Regarding the extent to which investors in new generation face appropriate locational signals, in the Authority's view, the issue is whether the existing locational signals in the WEM arrangements are adequate or whether additional signals (such as a locational Reserve Capacity Price) are needed.

The Authority recommends that the formerly-active Generation Location Working Group should be re-established to consider this issue under the auspices of the proposed WEM Future Strategy process.

[103] Alinta, Landfill Gas and Power, Western Power Networks, Synergy.

[104] Landfill Gas and Power.

[105] Western Power Networks.

[106] Synergy.

4.6 Bilateral market

4.6.1 Bilateral Contracts for energy and capacity

Currently, the majority of bilateral trade in the market is accounted for between Verve Energy and Synergy. This is to be expected given Verve Energy and Synergy remain the largest generator and the largest retailer in the market, respectively. During the 2008/09 Capacity Year, there has been an increase in the bilateral quantities traded between other Market Participants. The Authority expects that this trend will continue, with new entry increasing in the generation sector, with greater retail competition and with the displacement under the Vesting Contract.[107]

4.6.2 Submissions in response to the Discussion Paper

The IMO commented that, since Bilateral Contracts account for approximately 90 per cent of the market, the Authority's assessment of the effectiveness of the market should take account of the collective impact of bilateral trading arrangements.

4.6.3 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority commented that it did not have a strong view on the extent to which the market for Bilateral Contracts for capacity and energy promotes the Wholesale Market Objectives. This was largely because the dominance of the Vesting Contract between Synergy and Verve Energy meant that the majority of trade in the bilateral market was dominated by that one contract.[108]

4.6.4 Authority's view

The Authority notes that the WEM was designed with Bilateral Contracts at the centre of the market trading arrangements. The STEM is a market for day-ahead deviations from net bilateral positions and Balancing is a mechanism for deviations from Net Contract Positions. The IMO's Wholesale Market Design Summary paper of September 2006 points out that 'Bilateral trades of energy and capacity occur between Market Participants and the IMO has no interest in how these trades are formed'.[109]

While the Authority has an interest in ensuring that the bilateral market helps promote the Wholesale Market Objectives, particularly in terms of facilitating new entry in the generation sector and the retail sector, it notes that the precise counterparties and terms of Bilateral Contracts are confidential and are not a topic for the report to the Minister. Essentially, the bilateral market reflects privately negotiated contracts and, in the Authority's view, the most important factor in efficient outcomes in the bilateral market is a competitive wholesale market. In this regard, the Authority notes that an increase in the number of independent generators and retailers would be expected to lead to more efficient outcomes in the bilateral market.

[107] The Displacement Mechanism will gradually reduce the amount of Capacity Credits (and electricity) made available by Verve Energy and provided to Synergy under the Vesting Contract. This mechanism requires Synergy to increasingly expose contracted supply volumes (currently supplied under the Vesting Contract) to competitive sourcing, with defined volumes and scheduled dates.

[108] 2008 Minister's Report, p.62.

[109] Version 1.2, p.3.

The Authority notes that the increase in the number and size of independent generators and retailers has coincided with an increase in the volumes of bilateral quantities traded in the market. The Authority would expect that these trends will continue as the market evolves. However, the Authority also notes there are a number of structural issues in the market that can affect the bilateral market. These issues are discussed in Section 5.

4.7 Short Term Energy Market

A number of issues related to the STEM were raised by stakeholders and addressed in the Authority's Discussion Paper. These included the following:

- the value of the STEM;
- STEM timing; and
- STEM price caps and bidding rules.

Each of these issues is discussed in this section.

4.7.1 Value of the Short Term Energy Market

4.7.1.1 Outline in the Discussion Paper

As noted in the Discussion Paper, some stakeholders have questioned the value of maintaining the STEM in light of the purportedly small and decreasing volume traded in the market. As discussed in section 3.7.3 of this report, STEM volumes have increased in the most recent Capacity Year, with the commissioning of NewGen's first power station in the SWIS and Griffin Power's first power station in the SWIS. The Authority expects that as more new generators enter the market in coming years, higher trading volumes in the STEM are likely to continue.

In any case, the Discussion Paper highlighted that the STEM's role lies not solely in operating as a trading mechanism, but as a support to the Bilateral Contract market. The STEM provides both generators and retailers with the ability to diverge from their bilateral positions, and provides a price signal related to these deviations. The absolute quantities traded through the STEM are not pivotal in this context.

4.7.1.2 Submissions in response to the Discussion Paper

Most stakeholders considered that the STEM had a worthwhile place in the WEM design as a mechanism for generators and retailers to adjust their bilateral positions,[110] as a price setting mechanism for Balancing and as an availability measure.[111] However, one stakeholder commented that a move to competitive Balancing may make the existing STEM and Balancing mechanism largely redundant.[112] Further, one stakeholder pointed out that a drawback of the STEM is its lack of transparency in regard to both price and volume.[113]

The IMO commented that there has been significantly more trading on the STEM over the last nine months, with NewGen and Griffin Power entering the market. The IMO also commented that the MAC ranked the review of the STEM as a priority issue to be

[110] Landfill Gas and Power.

[111] Alinta.

[112] Alinta.

[113] Synergy.

addressed in the IMO's Market Rules Evolution Plan. Subsequently, in its Market Rules Evolution Plan Proposed Work Programme,[114] the IMO commented that various aspects of the STEM will be reviewed as a part of its process.

4.7.1.3 Authority's view

The Authority notes the broad recognition of the importance of the STEM in submissions to the Discussion Paper. However, the rationale for the STEM was also indirectly raised in the context of the discussion on competitive Balancing – in that a move to competitive Balancing may obviate the need for, and value of, the STEM.

It is the Authority's view that a transparent wholesale price – such as that provided by the STEM and Balancing prices – is an important feature of an effective energy market, particularly in promoting new investment. While the current effectiveness of the STEM and Balancing requires enhancement – as discussed in the sections that follow – the Authority considers that a transparent energy market is important if the market is to continue to achieve the Wholesale Market Objectives. A return to a market that consisted solely of Bilateral Contracts would, in the Authority's view, not be consistent with the Wholesale Market Objectives.

The Authority considers that until it can be demonstrated that competitive Balancing is capable of replacing the STEM, the Authority is of the view that the STEM is fulfilling its function in the WEM.

4.7.2 Short Term Energy Market timing

4.7.2.1 Outline in the Discussion Paper

As noted in the Discussion Paper, several stakeholders raised concerns about the timing of the STEM and the impact that the timing of the STEM has on the ability of generators to manage gas supplies. Some stakeholders suggested that the relatively early gate closure of the STEM compared to the timing of nominations for the Dampier to Bunbury Natural Gas Pipeline (**DBNGP**), and the risk of penalties in Balancing if insufficient gas is secured to fulfil STEM Bids, has the effect of deterring participation in the STEM.

4.7.2.2 Submissions in response to the Discussion Paper

Several participants suggested that changing the timing of the STEM or allowing for multiple gate closures in the STEM or 'rebidding' closer to real-time (as in the NEM) would improve the efficiency of generation dispatch.[115]

System Management commented that gate closures closer to real-time would place additional pressure on System Management due to scheduling of coal-fired generators operating on 12 hour forward plans and a lack of fluidity in gas markets.

[114] IMO, *Market Rules Evolution Plan Proposed Work Programme October 2009*, http://www.imowa.com.au/f173,161017/161017_MREP_Work_Programme.pdf

[115] ESAA, Synergy, Verve Energy.

4.7.2.3 Review of Recommendations and Findings from the 2008 Minister's Report

In consultation for the 2008 Minister's Report, most stakeholders supported greater alignment between the timing of the STEM and the timing of pipeline nominations for the DBNGP.

The main factors standing in the way of greater alignment between nominations for the DBNGP and STEM Submissions were:

- the scope for later STEM Submissions to permit greater exercise of market power in the STEM; and
- the substantial costs of changing the timing of the STEM.

Therefore, the Authority proposed that the question of greater alignment should be considered as part of the proposed road map process, in the context of the future direction of market development.

4.7.2.4 Authority's view

The Authority notes that the closer alignment of gas and electricity nominations (and/or the use of multiple gate closures) was a top-ranked issue of concern to stakeholders responding to the IMO's consultation on the Market Rules Evolution Plan. Regarding changes to the timing of the STEM, the Authority considers that the issue raises less far-reaching market design implications than many other potential changes to the WEM, such as competitive Balancing. On this basis, the Authority considers it would be appropriate and helpful for the IMO's Market Rules Evolution Plan process to address the timing of the STEM, potentially as an interim step towards the examination of competitive Balancing through a WEM Future Strategy process (see Section 4.8.2).

Recommendation 8

Section 4.7.2

The closer alignment of gas and electricity nominations (and/or changes to the timing of the Short Term Energy Market) is a top-ranked issue to be addressed by the Independent Market Operator's 'Market Rules Evolution Plan'.

The Authority recommends that the Office of Energy provide policy input into this process to ensure that work on the Market Rules Evolution Plan reflects broader policy objectives.

4.7.3 Short Term Energy Market price caps and bidding rules

4.7.3.1 Outline in the Discussion Paper

As noted in the Discussion Paper, some stakeholders have commented that there is an overlap between the STEM price caps and bidding rules. Given that generators are required to offer their energy in the market at SRMC, one stakeholder noted that the SRMC bidding rule effectively requires that bidders running on Non-Liquid Fuel will

comply with the non-liquid price cap and bidders running on Liquid Fuel will comply with the liquid price cap. Given this, stakeholders questioned the need for two STEM price caps, and indeed, the need for any price caps.

4.7.3.2 Submissions in response to the Discussion Paper

Two stakeholders commented that STEM price caps should not be required if the SRMC bidding rule remained in force.[116]

One stakeholder supported the continuation of different price caps for Liquid Fuels and Non-Liquid Fuels as an important mechanism for controlling the abuse of market power,[117] while another stakeholder commented that it would prefer a single price cap as it would aid in removing any backup fuel technology bias.[118]

Another stakeholder commented that it would support a review of bidding rules and price caps as part of the road map process.[119]

4.7.3.3 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority suggested that the removal of one or both STEM price caps was, along with the requirement for Market Generators to bid at SRMC, are fundamental design issues of the WEM.

4.7.3.4 Authority's view

The Authority maintains the view that the removal of one or both STEM price caps together with the requirement for Market Generators to bid at SRMC are fundamental design issues for consideration as part of a WEM Future Strategy.

The Authority also notes that the price cap issue was not rated highly in the IMO Market Rules Evolution Plan ballot, detailed in Section 1.3.2.[120]

4.8 Balancing

Two key issues relating to Balancing were raised by stakeholders and addressed in the Authority's Discussion Paper:

- decommitment of thermal plant; and
- competitive Balancing.

These two issues are discussed in this section.

[116] Verve Energy and Alinta.

[117] Landfill Gas and Power.

[118] Synergy.

[119] ESAA.

[120] The issue on Energy Price Limits was ranked number seven in priority in the IMO Market Rules Evolution Plan ballot. The IMO suggested that there was limited value in looking past the top ranked issues due to resource constraints.

4.8.1 Decommitment of thermal plant

4.8.1.1 Outline in the Discussion Paper

An issue raised by stakeholders was the emerging need for System Management to decommit (switch off) or cycle thermal base load plants at certain times, especially overnight, due to a combination of increasing amounts of must-run plant and comparatively low off-peak and trough period demand.

This combination of factors is leading to thermal generation plants, in particular Verve Energy plants, being cycled on a regular basis. System Management has expressed two key concerns about this outcome:

- physical/system security issues – if cycled plants cannot return to service the next day in time to meet peak loads; and
- economic inefficiency – due to the need to meet demand using liquid-fuelled plants (rather than lower variable cost coal or gas plants), as well as the implications for a shorter plant life for cycled base load plants.

A key issue in this context is the extent to which both the owners of must-run plant and Verve Energy face appropriate signals in the market regarding the economic efficiency implications of decommitment.

4.8.1.2 AEMC Climate Change Report

The AEMC Climate Change Report noted that the ability of wind generation to 'spill' into Balancing could create problems for system operation, particularly at low load times, such as overnight. The AEMC further noted that even if system security is preserved by turning down base load thermal plant, there is presently little transparency as to the basis for discretionary decisions.[121] The AEMC considered that although the WEM Rules provide the framework for the dispatch of plant in Balancing, the discretion allowed to System Management when making decisions concerning supply security requires increased codification and transparency.[122]

4.8.1.3 Submissions in response to the Discussion Paper

A number of stakeholders raised concerns about decommitment of thermal plant overnight. Stakeholders expressed concern about the effect of cycling on the technical operation and longevity of thermal plant,[123] and the risk that thermal plant would not be available in time to meet peak load on the day after the night that they were cycled, thereby jeopardising system reliability and security.[124]

System Management noted that it had recently commissioned a study which concludes that, in the future, low overnight demand growth and increasing penetration of intermittent generation could well result in Verve Energy's thermal facilities being cycled on a daily basis. System Management presented the findings of this study to the REGWG during October 2009.[125]

[121] AEMC Climate Change Report, pp.128-129.

[122] AEMC Climate Change Report, p.130.

[123] ESAA, System Management, Verve Energy.

[124] System Management, Verve Energy.

[125] IMO web site, *System Management Presentation on the findings of the ROAM Studies on Intermittent Generation*, October 2009,

In a follow up meeting, System Management also highlighted the impact of new capacities on Verve Energy. With the commissioning of NewGen Kwinana and Griffin Bluewaters 1, but without a corresponding increase in system load, Verve Energy would be required to generate around 500 MW less when these new units are cleared to run. This means that, taking into consideration system reliability, Ancillary Services and Verve Energy's 'tied generators' (cogeneration and others), dispatching Verve Energy remaining units will become more challenging. The Balancing capability of Verve Energy would be correspondingly reduced.

Some stakeholders considered that appropriate pricing signals would address issues associated with decommitment of plant. Two stakeholders suggested that a competitive Balancing mechanism would promote appropriate pricing signals, which may largely resolve the question of overnight decommitment of thermal plant.[126]

Two stakeholders commented that the Dispatch Merit Order requires Verve Energy to be dispatched prior to all other facilities. As a result, the Dispatch Merit Order may be inefficient.[127] Verve Energy commented that its decommitted plant is bid at SRMC while Balancing energy is bought at MCAP, and that MCAP frequently does not reflect Verve Energy's SRMC.

Stakeholders also commented on the transparency of dispatch decisions. Two stakeholders commented that there is currently insufficient transparency around System Management's approach to decommitting thermal plant overnight.[128] Alinta strongly supported the AEMC's recommendation for increased transparency of System Management's dispatch decisions and Balancing actions, and considered that increasing transparency should be undertaken ahead of considering further reforms of dispatch and Balancing arrangements in the WEM.[129] Alinta also suggested making publicly available a range of information regarding participants' bids, offers and actual output. System Management commented that its actions in decommitting plant overnight, or at any time, are entirely informed by the applicable Dispatch Merit Order. However, System Management noted that, currently, the Market Rules provide little, and often conflicting, guidance for operations during low load conditions. System Management also noted that it is acting to improve the predictability of its operations,[130] but nevertheless considers that the issue should be addressed within the Market Rules. In addition, System Management commented that it has developed a ring-fence which applies to all interactions with Western Power Networks to ensure all of System Management's actions are at arm's length to the network.

One stakeholder suggested the following principles in regard to overnight decommitment of plant:

- cycling of thermal generation plant should be avoided where possible, due to the impact on system security, plant life and maintenance costs;

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http://www.imowa.com.au/f139,173377/173377_WE_n6270977_v1J_PMO_MSD_INTERMITTENT_GENERATION_RESULTS_OF_ROAM_STUDIES.pdf

[126] ESAA, Synergy.

[127] System Management, Verve Energy.

[128] Alinta, Verve Energy.

[129] Alinta.

[130] In November 2009, System Management submitted to the Authority its Allowable Revenue proposal for the period 1 July 2010 to 30 June 2013, in which it forecast expenditure for a 'Dispatch Decision Support System' tool. See ERA web site, *System Management - Allowable Revenue Application 1 July 2010 to 30 June 2013*, http://www.era.wa.gov.au/cproot/8215/2/20091224 Western Power - Allowable Revenue Application - System Operation Services.pdf

- operators of must-run plant should be permitted to utilise the full range of negative prices available to the market so as to optimise economic operation; and
- other things being equal, Verve Energy's plant should not be preferentially decommitted.[131]

4.8.1.4 Review of Recommendations and Findings from the 2008 Minister's Report

The 2008 Minister's Report noted comments from stakeholders regarding the impact of increasing wind generation on the operation of base load plant at low load times.

The Authority also expressed concern regarding System Management's 'informal and non-transparent relationships' with other Market Participants in relation to dispatch arrangements. This specifically relates to System Management's relationship with Verve Energy. The Authority recommended that System Management should be made subject to more robust informational and organisational ring-fencing to ensure greater transparency and independence.

4.8.1.5 Authority's view

The Authority notes that, in the consultation for this Minister's Report, the issue of decommitment of thermal plant in the WEM was a more general concern than in previous years, when the concern was more closely related to the growth of wind generation.

Although the Authority understands that the REGWG is examining this issue, decommitment of thermal plant is an issue that has arisen, and increasingly will arise, irrespective of the expansion of wind capacity. This WEM feature indicates that a broader perspective is necessary in addressing this issue.

The Authority notes that a need to decommit thermal plant overnight arises due the following two factors:

- an excess of base load generation capacity over base load consumption; and
- the ability of intermittent generation to spill into Balancing.

The second factor operates through the following mechanism:

- intermittent generation displaces energy from thermal plant; and
- Load Following Services required by intermittent generation is better provided by flexible gas plant, which then displaces other thermal plant.

Both of these factors are discussed below.

Excess base load generation capacity

As discussed in section 4.4.2, the Authority considers that the incentives for investment in the appropriate mix, timing and location of new generation are driven by the price signals provided through Bilateral Contracting, the RCM, the STEM, the Balancing mechanism and network access charges. An excess of base load generation capacity over base load consumption should lead to lower prices – including negative prices – as the STEM price-quantity steps submitted by base load generators reflect avoidable shut-down and start-up

[131] Landfill Gas and Power.

costs.[132] In due course, the Authority would expect the market to correct this demand/supply imbalance through the retirement of less efficient base load units, an increase in base load demand brought about by the low or negative prices and even load shifting investment such as pumped storage. In the meantime, the inefficiency of having an imbalance between base load generation capacity and base load consumption will be minimised (though not eliminated) in the dispatch through STEM Submission prices.

The issue of appropriate price signals being provided to intermittent generation has been discussed in Section 4.4.2, and is discussed further in Section 5.2.

Intermittent generation spilling and transparency issues

Under the existing WEM design, Intermittent Generators are able to 'spill' energy into the Balancing market and receive MCAP. Going forward, this is likely to increase the need for System Management to decommit thermal plant overnight on a regular basis, as suggested in its study. The resulting dispatch will therefore be on a basis other than STEM Bids and STEM Offers. In the Authority's view, dispatch on a basis other than STEM Bids and STEM Offers is fundamentally what gives rise to inefficiency in Balancing. This also means that the MCAP and other prices used for settlement purposes in Balancing do not reflect the generation facilities used in real-time.

The price distortion problem implies that it is not always possible to understand System Management's dispatch decisions based on prices alone. Therefore, the Authority urges System Management to engage with the market to explain its dispatch decision process when the Dispatch Merit Order cannot fully capture all relevant considerations.

The Authority notes that the ring-fence developed by System Management between its operations and those of Western Power Networks should help to promote clarity regarding the division of its operations from those of Western Power Networks.

Recommendation 9

Section 4.8.1

In the event that there is an imbalance between base load generation capacity and overnight load, there may be a need to decommit base load plant overnight.

The Authority considers that, as long as there is not discrimination between energy options, the market will correct any such imbalance in due course.

In the interim, the Authority recommends that System Management's dispatch decisions, taking into account supply reliability considerations, need to be understood by stakeholders. System Management should be encouraged to widely explain its dispatch rationale to the market.

[132] Economic Regulation Authority, *Short Run Marginal Cost*, Discussion Paper, 11 January 2008.

4.8.2 Competitive Balancing

4.8.2.1 Outline in the Discussion Paper

Under the Market Rules, System Management schedules Verve Energy resources to 'balance' the system around Market Participants' Resource Plans. In the hours leading up to real-time, System Management will reschedule Verve Energy resources to balance the system as necessary. If required, System Management will issue instructions to other Market Participants so as to ensure supply matches demand.

As noted in the Discussion Paper, the IMO's Market Rules Evolution Plan includes consideration of an improved Balancing mechanism. This was identified as a priority issue by MAC members. The IMO noted that the present market design does not provide Balancing mechanisms that handle unexpected events between the clearing of the STEM and real-time, and this appears to create a number of issues which impact both Verve Energy and other Market Participants, including:

- under the day-ahead mechanism, Balancing prices do not always reflect the final dispatch and this impacts on the Balancing generator – Verve Energy – during the one day lag;
- independent power producers do not have the flexibility to move generation between their own units or purchase from another generator within the dispatch day, and thus are exposed to incurring unfavourable deviation prices in Balancing; and
- there appears to be a desire to allow independent power producers to contribute towards Balancing.

4.8.2.2 Oates Report

The Oates Report noted that the obligation to balance the impact of wind generation on the system rested with Verve Energy, for which Verve Energy is compensated at less than commercial rates.[133] One of the recommendations made in the Oates Report to improve reliability was to open up Balancing to competition.[134] The Report contended that the most efficient and reliable way to provide Balancing services was to ensure that all generators faced similar incentives:

> In competitive systems, it becomes increasingly difficult, costly and increasingly impractical for a single generation company to provide all or most of these services as its total share of system capacity falls.[135]

The Oates Report considered that this obligation on Verve Energy was not sustainable in the medium term.[136]

4.8.2.3 AEMC Climate Change Report

The AEMC Climate Change Report made many similar comments to those found in the Oates Report. The AEMC noted that the main responsibility for Balancing rests with Verve Energy, whose dispatch is adjusted in preference to adjusting that of other

[133] Oates Report, pp.6, 37.
[134] Oates Report, p.8.
[135] Oates Report, p.14.
[136] Oates Report, p.36.

generators.[137] This may be inefficient if other generators have lower costs of adjusting their output.

The AEMC recommended that in the first instance, the transparency of Balancing actions and costs should be increased (as it recommended for the dispatch process). If this revealed that the costs of Balancing were inefficiently high, more fundamental changes could be considered, such as the introduction of more competition into Balancing.[138] This could be achieved in a number of ways, such as by remunerating Verve Energy for its provision of Balancing services on a pay-as-bid basis, subject to bids being required to reflect each participant's SRMC, as in the STEM. Another option was to settle all participants at MCAP for their Balancing actions. Due to Verve Energy's market power, a move towards competitive Balancing should be based on satisfaction of a cost-benefit test.

4.8.2.4 Concept Consulting presentation to the Market Advisory Committee

As part of the IMO's Market Rules Evolution Plan, Concept Consulting was asked to make a presentation to the MAC on issues associated with competitive Balancing, and options for a move towards Balancing market reform. As part of this presentation, Concept Consulting highlighted a number of features that would form part of an ideal Balancing regime within the current overall market design.[139]

However, Concept Consulting noted that such a Balancing regime would involve significant changes to the market, and imply significant costs. Given this, Concept Consulting considers that it is worth exploring simpler options for reform of the Balancing regime, or transitional steps for reform. Options might include Balancing Support Contracts, STEM timing that is closer to real-time or multiple gate-closures in the STEM.

4.8.2.5 Submissions in response to the Discussion Paper

Several stakeholders supported consideration of a move to competitive Balancing, although recognising that this would be a substantial change to the market design.[140] While not expressing a direct opinion on competitive Balancing, one participant expressed support for giving Verve Energy maximum flexibility in performing its Balancing obligations, and ensuring it was properly compensated for providing Balancing.[141]

System Management also commented that a move to competitive Balancing would be a substantial change to the existing market design, and would require substantial consultation to ensure that such a change is appropriate, practical and is implemented efficiently.

The IMO commented that the MAC members ranked competitive Balancing first in priority out of thirteen areas set out in its Market Rules Evolution Plan. The IMO commented that Concept Consulting identified two options for introducing competitive Balancing:

- reducing real-time Balancing needs, which would place greater reliance on a STEM style mechanism and avoid more complex price-based dispatch systems; or

[137] AEMC Climate Change Report, p.105.

[138] AEMC Climate Change Report, pp.109-110.

[139] These were: (i) shorter commitment timeframes, (ii) competition in the supply of Balancing, (iii) Balancing prices that reflected the price of the marginal facility and (iv) a 'causer pays' recovery of Balancing costs.

[140] Infratil, Synergy.

[141] Landfill Gas and Power.

- opening up Balancing to direct competition, which would require more complex price-based dispatch systems.

The IMO commented that, as a next step, stakeholders will be consulted.

4.8.2.6 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority noted that it agrees in principle with competitive Balancing. However, a move to competitive Balancing would involve significant transitional costs and would raise other market design issues by potentially reducing the ongoing need for, and role of, the STEM.

For these reasons, the Authority recommended that the analysis of a move to competitive Balancing be undertaken as part of the road map process.[142]

4.8.2.7 Authority's view

As noted in the previous sections, by virtue of providing a better reflection of the real-time operating conditions, a competitive Balancing market could address other concerns about the WEM arrangements, such as the potential inefficiency resulting from overnight decommitment of thermal plant and the timing of, and bidding rules within, the STEM. Indeed, a competitive Balancing market may avoid the need for the STEM altogether.

The principal drawbacks of a move to competitive Balancing in the WEM have always been the ability of Market Participants other than Verve Energy to offer competitive Balancing and the substantial market power of Verve Energy, particularly in relation to real-time dispatch. While the Authority considers that the increasing new entry of generators may address the first issue, the second remains a concern. This would need to be carefully managed in any shift away from existing arrangements, including through consideration of bidding rules and price caps in the Balancing market to overcome concerns about Balancing offers reflecting market power.

As a result of the importance of this issue, the Authority considers that there is an urgent and growing need to progress work on examining the relative merits of various changes to existing Balancing arrangements, including, but not limited to, competitive Balancing. In this context, the Authority notes that competitive Balancing is the top-ranked concern of MAC members responding to the IMO's consultation on its Market Rules Evolution Plan and that the IMO has stated that it intends to move ahead with consultation on the options set out in the report by Concept Consulting.

In the 2008 Minister's Report, the Authority suggested that the merits of a shift in Balancing arrangements should be considered as part of the coordinated and policy-lead strategy for the future development of the market. However, in light of both the lack of progress on this process as well as the pro-active work of the IMO, the Authority considers that the IMO could progress work around the examination of competitive Balancing with oversight from the Office of Energy to ensure that the direction of the analysis is consistent with the Wholesale Market Objectives and other potential changes to the WEM arrangements that may emerge from the proposed WEM Future Strategy process.

The Authority would urge that the IMO initiative considers the costs and benefits of various options for reform as an early step in its review of alternative Balancing options.

[142] 2008 Minister's Report, p.65.

This should incorporate consideration of relevant market power issues to ensure that any reforms will in fact confer efficiency benefits and that these are widely distributed. At the same time, the Authority notes that as the costs of any move towards competitive Balancing are likely to be significant, the Authority considers that an interim solution could be changes to STEM gate closure (closer to real-time) or multiple gate closures on the day.

Recommendation 10

Section 4.8.2

The Authority recommends that the case for a move to competitive Balancing in the Wholesale Electricity Market should be considered. While the Authority considers that work on assessing the benefits of reform to Balancing arrangements can usefully occur within the framework of the Independent Market Operator's Market Rules Evolution Plan, it is important that this work is informed by policy input from the Office of Energy.

4.9 Administrative matters

4.9.1 Effectiveness of Independent Market Operator, System Management and the Authority

The Market Rules require the IMO to appoint a market auditor to carry out an audit, at least annually, of the IMO's compliance with the Market Rules and Market Procedures and System Management's compliance with the Market Rules and Market Procedures.

The market auditor appointed by the IMO – PA Consulting – has completed its audit of both the IMO and System Management.

4.9.1.1 Audit of the Independent Market Operator

Clause 2.14.3 of the Market Rules sets out the requirements for the audit of the IMO:

> The IMO must ensure that the Market Auditor carries out the audits of such matters as the IMO considers appropriate, which must include:
>
> a) the compliance of the IMO's internal procedures and business processes with the Market Rules;
>
> b) the IMO's compliance with the Market Rules and Market Procedures; and
>
> c) the IMO's market software systems and processes for software management.

In its audit report of the compliance of the IMO's internal procedures and processes with the Market Rules, and the IMO's compliance with the Market Rules and Market Procedures, PA Consulting found that the IMO has generally complied with its obligations under the Market Rules. PA Consulting found a small number of non-material breaches, and two material breaches. PA Consulting noted that in its opinion the issues leading to the two material breaches have been resolved.

In its audit report of the compliance of the IMO's market software systems and processes for software management, PA Consulting found that the IMO's systems and process comply with the Market Rules.

4.9.1.2 Audit of System Management

Clause 2.14.6 of the Market Rule sets out the requirements for the audit of System Management:

> In accordance with the Monitoring Protocol, the IMO must at least annually, and may more frequently where it reasonably considers that System Management may not be complying with the Market Rules and Market Procedures:
>
> a) require System Management to demonstrate compliance with the Market Rules and Market Procedures by providing such records as are required to be kept under these Market Rules or any Market Procedure; or
>
> b) subject System Management to an audit by the Market Auditor to verify compliance with the Market Rules and Market Procedures.

In its audit report of System Management's compliance, PA Consulting found that System Management has generally complied with its obligations under the Market Rules. PA Consulting found a small number of instances in which System Management has not complied. Only one instance was considered to be material. PA Consulting noted that the one material breach is the subject of discussion between System Management and the IMO as to the form of an appropriate Rule change.

4.9.1.3 Submissions in response to the Discussion Paper

Stakeholders were generally supportive of the effectiveness of the IMO, System Management and the Authority.[143] However, some stakeholders did raise particular issues.

- One stakeholder commented that the Authority is under-resourced and that this is a significant weakness in promoting market efficiency.[144]
- One stakeholder commented that there may be a significant potential conflict of interest in the IMO's multiple roles in the market and that it may be appropriate to consider whether there is merit in more formally delineating these responsibilities.[145]
- The IMO commented that the Authority's review of the effectiveness of the market may be more valuable from a strategic perspective if it was completed on a two or three year basis rather than annually. This longer timeframe would allow the benefits from new initiatives to be realised and would enable the Authority to assess the market from a more strategic viewpoint.

[143] Alinta, Infratil, Landfill Gas and Power,

[144] Synergy.

[145] Alinta.

4.9.1.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's report, the Authority recommended that System Management should be made subject to more robust informational and organisational ring-fencing to ensure greater transparency and independence.[146]

4.9.1.5 Authority's view

The Authority is pleased to note that most Market Participants view the performance of the IMO, System Management and the Authority in a favourable light. The Authority considers that this, as well as the positive conclusions of the audit reports of the IMO and System Management, indicates that the IMO, System Management and the Authority are generally operating effectively.

An issue raised in a submission was that the Authority is under-resourced and that this presents a significant weakness in promoting market efficiency. The Authority is of the view that, in respect of its obligations and functions under the Market Rules, it is adequately resourced with permanent staff and also has sufficient flexibility in respect of engaging appropriate and relevant internal and external expert advice on an as required basis.

In regard to the timing of the Minister's Report, the Authority considers there is merit in the IMO's suggestion that the Authority's report to the Minister could be more strategically valuable if it were undertaken every two or three years rather than annually. Under the present arrangements, there is generally only about six months between the publication of one Minister's Report and the commencement of informal consultation on the next report, which does not allow for a policy response and implementation of recommendations by the time the next report is due. At the same time, however, the Authority considers that there may be a case for more frequent updates to the publication of at least a portion of the MSDC data. For these reasons, the Authority is of the opinion that there would be benefits of a change to the Market Rules to require the Minister's Report to be published at least triennially, but with at least annual publication of the MSDC data. The Authority will consult with the Office of Energy before proceeding on this matter.

The Authority discusses the merits of delineating the IMO's multiple roles below in the context of the Rule change process.

4.9.2 Rule Change Proposal process

4.9.2.1 Outline in the Discussion Paper

As noted in the Discussion Paper, some stakeholders have expressed ongoing concern over the role of the IMO as both Rule enforcer and Rule maker in the WEM. The proposed means of addressing this concern was to reallocate the task of assessing at least major 'strategic' Rule changes to an independent party external to the MAC. More operational Rule changes could remain with the MAC.

4.9.2.2 Submissions in response to the Discussion Paper

One stakeholder considered that the number of Rule changes under consideration at any one time was excessive and that Rule change proposals lacked sufficient explanation or

[146] 2008 Minister's Report, p.81.

supporting evidence.[147] This participant also suggested that it would be beneficial to separate 'strategic' from 'operational' Rule changes, although two other stakeholders disagreed with the practicability of this proposal.[148]

One stakeholder suggested that effective and efficient market governance would be better facilitated by a clear demarcation in the roles of Rule making and market administration.[149]

The IMO commented that the Rule change process was not ranked highly as an issue in the IMO's Market Rules Evolution Plan. As a result, it is unlikely that a full review of the Rule change process will be undertaken within the next 18 months.

4.9.2.3 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority noted concerns expressed by some stakeholders regarding the IMO's role in managing the Rule change process and the participant composition of the MAC.[150] However, the Authority considered that most stakeholders seemed reasonably satisfied with the Rule change process.

4.9.2.4 Authority's view

The Authority notes that several stakeholders have commented on the multiple roles of the IMO, and the case for a clearer delineation or separation of those roles. The Authority considers that in light of the relatively small size of the WEM, there is a risk that important economies of scope would be lost if some of the IMO's roles were either allocated to a new entity or allocated to a ring-fenced division within the IMO with its own staff and subject to informational barriers. Requiring the IMO to dedicate specific staff to either one or other of the IMO functions could result in stalled progress on a number of fronts. For these reasons, the Authority does not consider there is a need to pursue the separation of the IMO's functions at the present time.

[147] Alinta.

[148] Synergy, System Management.

[149] ESAA.

[150] 2008 Minister's Report, pp.65-66.

5 Specific Events, Behaviour or Matters

Clause 2.16.12(c) of the Market Rules requires that the Minister's Report contains the Authority's assessment of any specific events, behaviour or matters that impacted on the effectiveness of the market.

This section sets out the Authority's assessment of specific events, behaviour or matters that impacted on the effectiveness of the market, including an outline of stakeholders' comments in response to the Authority's discussion paper.

5.1 Fuel supply

5.1.1 Outline in the Discussion Paper

In the 2008 Minister's Report upstream fuel supply issues were a significant issue for stakeholders – particularly following the Varanus Island incident. In the Discussion Paper for the 2009 Minister's Report, the Authority noted that fewer stakeholders had raised fuel supply constraint as an issue during consultation, but invited further comment.

5.1.2 Oates Report

The Oates Report raised gas supply constraints as a critical issue facing the electricity supply industry. It noted that the need for increased supplies of gas to fuel peaking plant is likely to expand as the penetration of intermittent wind plant – which requires fossil fuel back-up generation to offset lulls in wind power – increases over time due to the expanded RET. The Oates Report noted that Western Australia faces a particular challenge with sourcing significant volumes of 'economically viable' gas largely due to the exportability of Western Australian gas through LNG facilities. This meant that gas is competitive for peaking plant but not for base load or mid-merit plant. Coal prices are competitive for base load or mid-merit plant but are afflicted by considerable uncertainty arising from the future path of global energy prices and the future evolution of the carbon regime.[151]

The Oates Report highlighted that there is no overall policy or strategy for dealing with how fuel supply issues might be resolved over time. This implies a lack of consistency in participants' investment decisions and the risk of bringing inappropriate capacity into the system.[152] In response, the Oates Report recommended the development of a unified Government policy and strategy that, amongst other things, considers fuel supply and cost issues.[153]

5.1.3 AEMC Climate Change Report

The AEMC's Climate Change Report noted that gas is already a much more significant fuel for electricity generation in Western Australia than in the NEM, and demand for gas for peaking power is likely to increase over time due to the expanded RET. This could be expected to have the following effects:

[151] Oates Report, pp.21-22.

[152] Oates Report, p.22.

[153] Oates Report, p.39.

- increased demand for flexible gas supplies;
- additional tension arising from the lack of consistency between pipeline nominations on the DBNGP and STEM submissions; and
- potentially exacerbate security of supply issues regarding the State's reliance on the DBNGP.

One path that has been adopted to encourage increased and more flexible gas supplies in the Eastern States is a gas market bulletin board and a short term trading market for gas. However, the AEMC noted that little use has been made of the local bulletin board following the immediate aftermath of the Varanus Island interruption. It is therefore not likely to be worthwhile for Western Australia to join the bulletin board and short term trading market operating in the Eastern States.

Therefore, in contrast to the view expressed in the Oates Report, the AEMC concluded that regulatory intervention was unlikely to materially assist in alleviating problems relating to fuel supplies – increased and more flexible gas supplies should accrue over time in response to market forces.[154]

5.1.4 Gas Supply and Emergency Management Committee

The Discussion Paper noted that on 29 January 2009 the Western Australian Government announced the establishment of the Gas Supply and Emergency Management Committee. The Committee is tasked with reviewing the security of the State's gas supplies and the management of any future gas supply disruptions. The Committee presented its report to the State Government in early September and the Minister tabled its final report on 13 October 2009.[155] The Committee found that the high penetration of gas in the electricity generators' fuel mix means that major gas disruptions have significant flow-on effects on electricity supplies. Therefore, the Committee identified a number of options that would help minimise the impact of a gas supply disruption. From an electricity perspective, these include increasing the number of dual gas/liquids generators in the electricity market, developing a gas storage facility near Perth and increasing the level and transparency of gas market information.[156]

5.1.5 Submissions in response to the Discussion Paper

Few stakeholders commented on fuel supplies issues in their submissions. One stakeholder commented that gas supplies for power generation are limited in Western Australia, and that prices have risen substantially in recent years.[157] This stakeholder considered that there is a need for strategic Government policy to facilitate development of geographically diverse fuel supplies and fuel types.

In verbal comments to the Authority, Western Power Networks commented that the framework around supply security gave no consideration to diversity of fuel type. For example, there was no explicit consideration of whether a power system could cope with a gas supply disruption.

[154] AEMC Climate Change Report, pp.126-7.

[155] Gas Supply and Emergency Management Committee, *Report to Government*, September 2009.

[156] See pp.4-5.

[157] Extension Hill.

5.1.6 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority suggested that investors were best positioned to assess the relevant opportunities and risks of expanding fuel supplies. To test the robustness of this view, the Authority recommended that consideration be given to the extent to which the design of the market enables participants to manage short-term and long-term fuel constraints in a way that promotes efficient outcomes.

5.1.7 Authority's view

The Authority remains of the view that investors in generation plant are best positioned to respond to the opportunities and risks associated with fuel supplies. Indeed, access to secure and economic fuel supplies is one of the key issues to be managed by investors in generation plant. This view was shared by the AEMC in its recent Climate Change Report. Like the AEMC, the Authority does not see a case for intervention in these decisions in the absence of clear evidence that the market is failing to deal with these risks and opportunities. Similarly the Authority also sees the issue of reliability as to be settled by the investors. Therefore the Authority does not see a case for specific payments to be made for Liquid Fuel capability as suggested in the Oates Report.

5.2 Intermittent generation

5.2.1 Outline in the Discussion Paper

As noted in the Discussion Paper, the treatment of wind power in the WEM raised considerable comment in the consultation for the 2008 Minister's Report. There was less comment on the treatment of intermittent generation within the consultation undertaken prior to this Discussion Paper. This seems to be at least partly a result of the expectation that issues associated with intermittent generation would be dealt with through the REGWG. (As discussed in Section 4.8.1, the related issue of the decommitment of thermal plant was a key issue raised by stakeholders).

5.2.2 Oates Report

The Oates Report highlighted a number of implications of the growth of intermittent generation arising from the expanded RET scheme. This included the need for additional flexible fossil fuel plant to offset variability in wind generation output. Apart from being an inefficient way to serve demand,[158] this was expected to put pressure on the availability of domestic gas supplies, as discussed above.[159] The growth of intermittent generation would also increase pressure on the limits of the transmission network. Further, growth in intermittent generation would exacerbate difficulties around the management of base load plant at low load times, which can impact next-day reliability if base load plant needs to be cycled to accommodate variable intermittent output.[160]

The Oates Report posited that given that Verve Energy provided Balancing services in the WEM often below cost, and wind typically created the need for additional Balancing

[158] Oates Report, p.33.

[159] Oates Report, p.21.

[160] Oates Report, p.36.

services, wind plant was effectively being subsidised by Verve Energy – and ultimately by wholesale customers in the State.[161]

5.2.3 AEMC Climate Change Report

The AEMC Climate Change Report concluded that the growth of intermittent wind plant is likely to have a number of implications, some of which would require modification of the WEM arrangements. The likely implications include:

- greater challenges for operating the power system within its technical limits, due to the effect of wind on voltage and frequency levels;[162]
- inefficient dispatch due to the ability of wind to 'spill' into Balancing and the consequent need for Verve Energy thermal plant to offset wind generation variability;[163]
- inefficient dispatch as a result of System Management choosing to run flexible gas plant in place of coal base load plant to accommodate the variability of wind output;[164]
- the need for increased network investment to connect dispersed wind plant and the inefficiency of network investment to accommodate wind output in light of wind plants' low capacity factors;[165]
- the need for additional and flexible gas supplies to fuel the flexible thermal plant necessary to provide a back-up to wind;[166] and
- the over-allocation of Capacity Credits to wind plant in the Reserve Capacity Mechanism in light of the typically limited contribution of wind plant to supplying peak load.[167]

As noted above, many of these issues were also subsequently raised in the Oates Report.

5.2.4 Renewable Energy Generation Working Group

The REGWG, has been formed under the MAC to consider and assess the system and market issues arising from the increase in the expanded RET to 45,000 GWh by 2020. In particular, the REGWG is required to focus on a number of priority issues related to intermittent renewable energy generation, including:

- Capacity Credits allocated to Intermittent Generators through the Reserve Capacity Mechanism;
- the impact on demand for Ancillary Services; and
- system security at times of low load.

The Authority notes that the REGWG has got to the stage where it has sought advice on the reserve capacity and reliability impacts of climate change policies (Work Package 2) and issued requests for tender for advice on:

[161] Oates Report, p.37.
[162] AEMC Climate Change Report, pp.104-5.
[163] AEMC Climate Change Report, p.106.
[164] AEMC Climate Change Report, p.106.
[165] AEMC Climate Change Report, p 116.
[166] AEMC Climate Change Report, p.125.
[167] AEMC Climate Change Report, p.129.

- impacts from State and National Policy on the generation plant mix, particularly renewable generation (Work Package 1);
- impacts of increased intermittent generation on the requirement for frequency control services (Work Package 3); and
- impacts of increased intermittent generation on the Technical Rules (Work Package 4).

5.2.5 Submissions in response to the Discussion Paper

In response to the Discussion Paper, stakeholder submissions highlighted some of the issues associated with increased intermittent generation.

- Increased wind generation increases demand on network capacity and Ancillary Services requirements.[168]
- Intermittent generation can create additional costs and potential risks to security and stability of supply.[169]
- A significant increase in the penetration of intermittent generation will cause system security issues overnight, will lead to an increase in costs and will lower the efficiency of dispatch. Further, an increase in the penetration of intermittent generation will drive the need, at significant cost, for additional Ancillary Services such as frequency control and Spinning Reserve.[170]

Many stakeholders were supportive of ensuring that the costs associated with intermittent generation were transparently identified and appropriately attributed to Intermittent Generators as the 'causers' of those costs.[171] This includes the costs of intermittent plant 'spilling' into the market and resulting in thermal plant having to shut down and restart. One stakeholder proposed a cap on wind generation at times of erratic supply or low demand.[172]

In this context, System Management commented that the Authority may wish to consider whether applying the current SRMC regime for STEM Offers to pay-as-bid Balancing prices would result in a more economically efficient market and reduce discrimination in favour of intermittent generation.

Several stakeholders also considered that the capacity payments received by intermittent generation should be reviewed to reflect the contribution that they make to peak load.[173]

A number of stakeholders noted that the REGWG was expected to address issues in relation to intermittent generation. However, Landfill Gas and Power noted the slow progress of the REGWG and suggested that the deliberations of the group should be expedited.

[168] Synergy.
[169] Western Power Networks.
[170] Verve Energy.
[171] Western Power Networks, Synergy.
[172] Verve Energy.
[173] Western Power Networks, Synergy.

5.2.6 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority recommended that wind generators should be required to pay for the costs they impose on the power system on a causer pays basis.

5.2.7 Authority's view

The Authority remains of the view that the treatment of intermittent generation is a significant issue for the market. Since the previous Minister's Report, legislation to implement the expanded RET has been passed. The Authority considers that decisions regarding the treatment of intermittent generation in the WEM – including to ensure that Intermittent Generators pay for the costs they impose on the power system that are over and above the costs imposed by conventional generators – are therefore increasingly urgent.

The Authority also notes that the AEMC has made a number of recommendations regarding the treatment of intermittent generation in the WEM.

The Authority considers that the REGWG is the appropriate forum to address issues related to renewable generation, and notes that much work has been done and is being done through this process. This includes two studies commissioned by System Management on the operational aspects of higher intermittent generation in the generation mix. While the Authority considers that the REGWG began its work slowly, the Authority notes the IMO's recent release of requests for tender seeking advice on a number of issues concerning intermittent generation and looks forward to the outcomes of these analyses.

The Authority considers that the REGWG process could – when completed – result in some wide ranging changes to the treatment of intermittent generation in the Market Rules. These could cover:

- altered Reserve Capacity Credit allocation for Intermittent Generators;
- an Ancillary Service cost recovery regime or a requirement on intermittent plant to procure additional Load Following Services themselves; and
- voluntary STEM participation and Resource Plan coverage for Intermittent Generators (disallowing spill in the Balancing market as price takers).

These changes may be negative from the perspective of intermittent generation interests. While some changes (such as alterations to Reserve Capacity Credit allocations) have been flagged for some time, the Authority considers that the other impacts should also be flagged as early as possible so as to maintain investor certainty and to provide appropriate investment signals before the next Reserve Capacity Cycle. Balancing the concerns of investors in intermittent generation with the need for cost-reflectivity is likely to be a challenge for the market and the REGWG should consider forming a clear transition regime to assist in this task.

In respect of the matter raised in a submission of whether applying the current SRMC regime for STEM Offers to pay-as-bid Balancing prices would result in a more economically efficient market and reduce discrimination in favour of intermittent generation, as discussed in Section 4.8.2, the Authority considers that careful consideration needs to be given to bidding rules and price caps in any move to competitive Balancing. The Authority also notes that the IMO is currently able to reject a change to Standing Data related to prices submitted to the IMO where the IMO is not

satisfied with evidence provided that the data represents the reasonable cost of the Market Participant in circumstances related to that price.[174]

Recommendation 11

Section 5.2.7

Significant changes to the treatment of intermittent generation in the Wholesale Electricity Market will have implications for investor certainty.

For this reason, the Authority recommends that the work of the Market Advisory Committee's Renewable Energy Generation Working Group should consider the provision of a clear transition regime to manage changes in the treatment of intermittent generation.

5.3 Demand Side Management

5.3.1 Outline in the Discussion Paper

As noted in the Discussion Paper, in order for DSM to provide an alternative to generation capacity, the RCM requires loads that are offering DSM to the market to be 'signed up' two years in advance. However, a contract between a retailer and end user for providing DSM may not coincide with this Reserve Capacity Cycle. Given the uncertainty of contracting with an end use customer, some stakeholders commented that two years was too long and suggested that DSM should be rewarded independently from its value in providing Reserve Capacity.

5.3.2 Submissions in response to the Discussion Paper

A number of stakeholders commented that the timing of the RCM created problems for DSM and acts as a disincentive on DSM to participate in the RCM.[175] One stakeholder commented that, based on anecdotal evidence, the current arrangements for DSM suit market aggregators but do not suit large industrial customers.[176] This stakeholder considered that large industrial customers would be more inclined to participate in a DSM mechanism in which DSM providers offered energy, rather than capacity, to the market.

However, the IMO commented that the market has been successful in incorporating DSM, having attracted a number of DSM suppliers who have participated in the RCM. The IMO commented that it expected the contribution of DSM to continue to grow over time.

Western Power Networks noted that it has developed a series of discrete projects in order to build up a knowledge base regarding the viability of DSM options compared to traditional poles and wires. Western Power Networks commented that it is of the view that it is not currently adequately incentivised to actively promote and develop DSM resources.

[174] Market Rule Clause 2.34.7

[175] Landfill Gas and Power, Synergy.

[176] Alinta.

With improved regulatory incentives – including funding for research and trials – Western Power Networks considers that more DSM would become available.

5.3.3 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority considered that the market objectives required DSM to be treated in a competitively neutral manner to other forms of capacity, including for the purposes of the RCM. This meant recognising that DSM is a less firm or reliable resource than, say, thermal generation. The Authority recommended that arrangements governing the participation of DSM in the market should be considered as part of the road map process.

5.3.4 Authority's view

The Authority notes that stakeholders have different views as to the incentives for DSM within the WEM arrangements. Those concerned about a lack of incentives for DSM refer to the strictures of the RCM. From the Authority's perspective, it appears that the very aspects of the RCM that are designed to provide certainty for generation investors also may serve to discourage loads from offering DSM. These aspects include the need for a given quantum of capacity to be offered two years in advance and the very fact that the arrangements reward capacity rather than energy. Nevertheless, the Authority considers that as long as the WEM incorporates the RCM, the IMO is under an obligation to ensure sufficient capacity is available two years in advance and it is difficult to justify alternative treatment for DSM within the RCM.

The Authority also notes that, since the Discussion Paper was released, DSM providers have been granted capacity credits for the 2011/12 Capacity Year, indicating that the RCM does not constitute an insurmountable barrier for DSM providers.

For these reasons, the Authority is comfortable with the current arrangements governing the participation of DSM and will not renew its recommendation in the 2008 Minister's Report that DSM arrangements in the Market Rules be further examined.

On the issue of DSM as an alternative to network augmentation, the Authority would welcome specific proposals from Western Power Networks under the approved Access Arrangement.[177]

5.4 Ancillary Services

5.4.1 Outline in the Discussion Paper

As noted in the Discussion Paper, the Authority has previously raised concerns regarding System Management's progress in putting together a procurement strategy for Ancillary Services. However, in preliminary consultation for this Discussion Paper, System Management indicated that it has made significant progress in Ancillary Service

[177] The Access Arrangement approved by the Authority's *Further Final Decision on Proposed Revisions to the Access Arrangement for the South West Interconnected Network* (released on 19 January 2010), includes a scheme (titled 'D-Factor') that provides a financial framework for the treatment of expenditure specifically used for demand management to defer or obviate the need for the supply side capital expenditure option. This scheme is designed so that the Authority will make allowance in Western Power Networks' target revenue, so that Western Power Networks is financially neutral as a result of adopting DSM to defer capital expenditure projects.

procurement. In particular, the Discussion Paper noted that System Management is in the process of procuring System Restart services.

The Discussion Paper also noted that Rule Change RC_2008_38 *Least cost determination of Ancillary Service Contracts*[178] came into effect on 1 June 2009. This Rule change addresses an ambiguity in the Market Rules regarding the requirement for 'least cost' Ancillary Services procurement. System Management considers this Rule change was necessary for it to procure Load Following Service and Spinning Reserve from non-Verve Energy participants, in accordance with the requirement of the Market Rules.

5.4.2 Oates Report

The Oates Report made similar comments about Ancillary Services as it did about Balancing services: that it was inefficient to rely solely on Verve Energy to provide these services. According to the Oates Report, the most efficient and reliable way to provide these services should ensure that all generators face similar incentives to provide them. Thus, Ancillary Services should be opened to competitive provision in a similar way that Balancing services should be opened to competition.

5.4.3 AEMC Climate Change Report

Most of the comments about Ancillary Services in the AEMC's Climate Change Report concerned the need to ensure that the parties that created the need for Ancillary Services were required to pay the cost of those services. This view particularly applied to wind generators, which are expected to increase the need for reserve generation. If these costs were not recovered from the responsible causers, inefficient outcomes would be likely to result. The AEMC endorsed the work of the REGWG in this respect.[179] The AEMC also supported the more competitive provision of Ancillary Services. One option was to allow individual participants to provide 'self-cover'.[180]

5.4.4 Submissions in response to the Discussion Paper

One stakeholder commented that Ancillary Services should be competitively procured, and supported the management of this issue through the IMO's Market Rules Evolution Plan.[181] However, another stakeholder commented that there would be both costs and benefits of competitive tendering for Ancillary Services, and recommended a cautious and balanced assessment of these costs and benefits.[182]

One stakeholder noted that System Management submitted Rule Change RC_2008_38 in order to facilitate it entering into an Ancillary Services Contract for Spinning Reserve and Load Following Service by Market Participants other than Verve Energy.[183] However, Rule Change RC_2008_38 will not provide Market Participants with the level of clarity and certainty required in order to competitively offer Spinning Reserve or Load Following Service. Therefore, this participant recommended that a more comprehensive review would need to be undertaken.

[178] See IMO web site, RC_2008_38 Least cost determination of Ancillary Service Contracts, http://www.imowa.com.au/n323.html

[179] AEMC Climate Change Report, pp.107-9.

[180] AEMC Climate Change Report, pp.112-113.

[181] Landfill Gas and Power.

[182] Synergy.

[183] Alinta.

Another participant commented that it has recently tendered for the provision of System Restart Services and that while there were minor process issues associated with the tender, these were resolved promptly through discussion with Western Power.[184]

The IMO commented that the review of Ancillary Service Standards and Requirements Study is almost complete. This report recommends, among other things, that changes be made to reduce the dominance of Verve Energy in the provision of Ancillary Services.[185]

System Management commented that the outcome of the Ancillary Service procurement process will indicate whether the pricing structure indicated in the Market Rules is sufficiently attractive to encourage competitive supply of Ancillary Services, but that it is too early at this stage to form a conclusive view.

System Management also noted that, currently, where MCAP is negative, Verve Energy must pay the market when it provides Ancillary Services. System Management noted that Rule Change RC_2009_21 *Treatment of Negative MCAP on the settlement of Ancillary Services*[186] is intended to prevent this occurring. System Management noted that it intends to have a similar provision in place for any contract for the provision of Ancillary Services, so that if MCAP is negative, the payment for availability will be zero. The final report on Rule Change RC_2009_21 was published in October 2009 and the amending Rules set out in Rule Change RC_2009_21 commenced on 1 February 2010.

5.4.5 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority gave its strong support for further moves towards competitive procurement of Ancillary Services. The Authority noted that it anticipated significant progress on this matter in the coming year.

5.4.6 Authority's view

The Authority commends System Management's efforts in advancing the competitive procurement of Ancillary Services, an area where the Authority was critical of System Management in the 2008 Minister's Report. System Management expects to enter into its first System Restart contract with an independent power producer, which is due to be finalised over the next few months. It is also progressing along its program to procure Load Following Services.

The Market Rules require the Authority to approve three-year budgets for the IMO and System Management. This once-every-three-year process commenced in November 2009. Included in the determination are the parameters for Ancillary Service payments for Load Following Service and Spinning Reserve, Load Rejection Reserve Service and System Restart. With this determination in mind, the Authority commissioned a preliminary study on Load Following Service and Spinning Reserve. The Market Rules currently have Load Following Service and Spinning Reserve treated as a single product. The preliminary analysis suggests that it could be appropriate to break them up as separate products. This suggestion is supportive of the submission from Alinta in response to Rule Change RC_2008_38 that the compensation arrangements in the

[184] Perth Energy.

[185] See IMO web site, *Ancillary Service Standards and Requirements Study Final Report*, 6 November 2009, http://www.imowa.com.au/f685,166353/166353_AS_Study_Final_Report.pdf

[186] See IMO web site, RC_2009_21 Treatment of Negative MCAP on the settlement of Ancillary Services, http://www.imowa.com.au/RC_2009_21

Market Rules may be too uncertain for an independent power producer to agree to provide Load Following Service and Spinning Reserve.

While cognisant of these concerns System Management believes that it should proceed with its program now that its Rule change has been accepted – the test is how the market responds rather than the Authority's preliminary theoretical study. Given that System Management has already issued a request for expressions of interest for 30 MW of Load Following Service, the Authority considers it counterproductive to discourage the process. If a comprehensive review is needed it could be started after System Management has reviewed the expression of interest responses from Market Participants.

In its review the Authority would urge System Management to be conscious of the potential false negative conclusion. This was the comment the IMO made in the RC_2008_38 Rule change discussion. Testing the market and not receiving any offer may not confirm that there is no interest from independent power producers to supply but rather that the payment mechanism for these Ancillary Services under the Market Rules is flawed. Thus the Authority would urge System Management to ask potential Load Following Service suppliers why they are not responding to the request for expression of interest. The Authority would also urge these Market Participants to respond with their concerns if they consider the Market Rules payment mechanism is unhelpful.

A complicating element in the System Management Load Following Service procurement exercise will be the three-year review. By the end of March 2010 the Authority would have determined the new set of availability margins used to determine the compensation for Load Following Service and Spinning Reserve provision. There has been suggestion that the current margins, unchanged since set market commencement, are inadequate. The Authority will thus be mindful that these margins are set to compensate all providers and provide an appropriate price signal to the market. Prospective respondents to the System Management Load Following Service procurement exercise are likely to be reluctant to commit to providing a Load Following Service until the Authority's determination has been completed. Prospective respondents may also be concerned about prices being set for a three-year period, given that this will effectively lock in prices for this period. However, the Authority understands the Bilateral Contracts for capacity and energy are frequently agreed for periods longer than this.

The Authority is also conscious that should the market, including System Management, decide that a comprehensive review is needed then the availability margins determined will effectively be short-lived.

Should the market decide that a comprehensive review is appropriate; the Authority would encourage the IMO to convene a working group and lead the review process of the payment mechanism for the provision of Ancillary Services. The Authority considers that System Management should have a significant role in the working group, given the technical nature of the task, and that Verve Energy should also have a significant role in the working group, given the potential impact on the incumbent provider and potential suppliers.

In considering this matter the Authority would also like to bring to the Minister's attention that the larger value component of Ancillary Services (being Load Following Service and Spinning Reserve combined) is still a minor portion of the electricity market. But while minor, the Authority would urge progressing the review of Ancillary Services procurement due to the increasing need for Load Following Service, as intermittent generation is expected to become more significant in the generation mix over the coming years, highlighting the need for improved efficiency in procuring this service from a wider field of providers than just Verve Energy alone.

5.5 Plant outage information

5.5.1 Outline in the Discussion Paper

As noted in the Discussion Paper, some stakeholders supported the provision of more detailed advance information about planned outages, in order to enable participants to make better operational decisions. Other participants emphasised the need for greater transparency regarding the nature of outages (planned and forced) after the fact.

5.5.2 Submissions in response to the Discussion Paper

In submissions responding to the Discussion Paper, stakeholders were generally supportive of Rule Change RC_2009_05 *Confidentiality of Accepted Outages*,[187] which permits the provision of information on scheduled outages by System Management to Western Power Networks, enabling Western Power Networks to better coordinate network outages with scheduled generation outages. However, views on providing this information more broadly differed.

Alinta, Landfill Gas and Power and Synergy commented that they are generally supportive of transparency and broader dissemination of information, with Alinta commenting that it supports making information on scheduled outages available to all Market Participants. System Management commented that it does not see a need for wider release of outage information following the outcome of Rule Change RC_2009_05, but would also not oppose wider release of such information.

The IMO commented that during the process for Rule Change RC_2009_05, the IMO Board requested a broader review of the transparency around outages and the overall outage planning process. The IMO commented that this is currently classified as a medium priority and therefore likely to be progressed in the next 6 to 12 months.

5.5.3 Authority's view

The Authority is strongly supportive of relevant and transparent information being provided to Market Participants regarding plant outages in a timely manner. In light of the implementation of Rule Change RC_2009_05, the Authority considers that the question of the dissemination of plant outage information can be adequately dealt with through the Rule change process. In this context, the Authority supports the IMO Board's encouragement for the IMO to conduct a broader review likely to be progressed in the next 6 to 12 months. The Authority also notes that a review of the outage planning process is mandated in the Market Rules under Clause 3.18.18. The IMO may wish to consider including the broader review as part of the Clause 3.18.18 process. Besides involving System Management as required in the Market Rules, the Authority would urge the IMO to consult Market Participants in the review.

5.6 Metering

5.6.1 Outline in the Discussion Paper

The Discussion Paper raised two issues in relation to the accuracy and timing of metering in the WEM.

[187] See IMO web site, RC_2009_05 Confidentiality of Accepted Outages, http://www.imowa.com.au/n247.html

First, one stakeholder claimed that Western Australia is the only jurisdiction in Australia where significant generators are settled on the basis of SCADA data, instead of more accurate revenue-quality metering data. The Authority noted in the Discussion Paper that the use of SCADA data for Verve Energy generation could impact all Market Participants in the context of the allocation of common costs, such as market fees.

Second, the Discussion Paper noted that a number of stakeholders expressed a related concern about the significant delays to settlements in the market.

5.6.2 Submissions in response to the Discussion Paper

Several stakeholders supported the installation of revenue-quality meters to Verve Energy's facilities, at least on a trial basis in order to ascertain the potential inaccuracy introduced into the settlement process by the use of SCADA data.[188] Another stakeholder supported the adoption of revenue-quality metering in principle but did not consider it a crucial issue in the short term.[189]

One stakeholder commented that it would support a review of the costs and benefits of improved metering, and that the IMO is best placed to undertake this review.[190]

Conversely, Western Power Networks was of the view that installing revenue-quality metering at Verve Energy's generation sites would not currently have a material effect on the allocation of common costs. Further, Western Power Networks noted that previous estimates suggested that the installation of revenue-quality metering at Verve Energy's generation sites would cost $7.2 million and take two to three years to complete. Based on current market conditions, Western Power Networks considered that the costs are likely to have increased significantly.

5.6.3 Authority's view

Following correspondence from Western Power Networks, the Authority understands that the installation of revenue-quality meters at Verve Energy's facilities would not have significant implications for the allocation of common costs in the WEM. Therefore, the Authority has no basis for finding that the lack of revenue-quality meters at Verve Energy facilities is presently compromising the effectiveness of the market.

However, the Authority considers that the new Kwinana High Efficiency Gas Turbines and the refurbished Muja A/B facilities should be fitted with revenue-quality meters.

5.7 Retail tariffs, rebates and full retail contestability

5.7.1 Outline in the Discussion Paper

As noted in the Discussion Paper, the ongoing non-cost-reflectivity of retail tariffs was considered by a number of stakeholders to hinder retail competition and to discourage the new entry of generators as well as retailers. Stakeholders generally recognised that significant progress has been made since the consultation for the 2008 Minister's Report, with the Government announcing increases in tariffs to take effect during 2009. While these increases are not sufficient to achieve cost-reflectivity, a number of stakeholders

[188] Alinta, Verve Energy, System Management, IMO.

[189] Synergy.

[190] Landfill Gas and Power.

commented that a tariff glide path towards cost-reflectivity is appropriate given the magnitude of the required increases in tariffs.

5.7.2 Oates Report

The Oates Report supported increasing retail tariffs to cost-reflective levels as soon as possible to remove a key barrier to competition.

The Oates Report also noted that FRC would increase the risks faced by the State, as the effective underwriter of new generation capacity through its ownership of Synergy and Verve Energy. The Oates Report supported deferring FRC for customers consuming less than 50 MWh per annum, to allow the industry to focus on more immediate priorities.[191]

5.7.3 AEMC Climate Change Report

The AEMC Climate Change Report has noted that the CPRS will significantly increase the level and volatility of wholesale electricity purchase costs faced by retailers. The increases in costs will be hard to forecast, and initially difficult for retailers to manage with financial hedging instruments. These factors will make it very difficult for pricing regulators to accurately forecast and allow for costs in retail prices.

The AEMC noted that the increased risks to retailer viability and competitive retail markets that may follow the introduction of the CPRS require the introduction of increased flexibility in pricing structures where retail price regulation is retained. The AEMC has recommended that by the time the CPRS commences, jurisdictions should have developed an adjustment mechanism for energy and carbon related-costs which:

- can be invoked as frequently as every six months, subject to a cost change threshold;
- is symmetrical to allow adjustment for increasing or decreasing costs; and
- can be initiated by retailers where costs are rising.

5.7.4 Renewable energy buy back and rebate schemes

There are a number of Government energy schemes to encourage households to use (and sell) renewable forms of energy, including feed-in tariff schemes and solar power credit programs. Historically, the State Government has made provision for renewable energy buy-back schemes in Western Australia. The State Government is also committed to introducing a feed-in tariff for renewable forms of energy commencing in Western Australia on 1 July 2010. With feed-in tariff schemes a set rate is paid for electricity production[192] from small-scale renewable electricity generation. These generation sources may include photovoltaic, wind and micro-hydro systems.

The State Government released a discussion paper in October 2009 on the design of the upcoming feed-in tariff scheme, with public submissions closing in November 2009. A report summarising the issues raised in response to the discussion paper was published

[191] Oates Report, p.41.

[192] Payments can be paid for electricity production on a net basis, that is, payment for the net (surplus) renewable energy exported to the mains grid; or on a gross basis, that is, payment for the total renewable energy produced by these systems. Currently NSW and the ACT have gross feed-in tariff schemes, while other jurisdictions have net feed-in tariff schemes.

on the Office of Energy's web site in February 2010.[193] The State Government has indicated that the feed-in tariff will likely be paid on a net renewable energy generation basis to residential households; however, details of the tariff structure have yet to be announced by the State Government.

The Authority considers that unless feed-in tariff schemes and solar power credit programs are designed appropriately and the level of tariff or credit is appropriate, there is the potential for renewable energy buy back and rebate schemes to lead to inefficient investment and utilisation of State resources. The Authority also understands that, depending on the number of small-scale renewable generators, in the longer term there may be power system control and operational issues that need to be addressed. The Authority intends to monitor these matters more closely in future, to ensure that any potential negative consequences for market effectiveness are addressed in a timely manner.

5.7.5 Submissions in response to the Discussion Paper

Submissions from numerous stakeholders supported the implementation of cost-reflective tariffs as a priority.[194] Cost-reflective tariffs would restore Verve Energy profitability, promote energy efficiency, reduce carbon emissions and encourage retail competition.[195]

Two stakeholders also supported the introduction of FRC.[196]

5.7.6 Review of Recommendations and Findings from the 2008 Minister's Report

One of the key findings in the 2008 Minister's Report was that cost-reflective retail tariffs were necessary to avoid distortions at both the retail and wholesale levels of the market. More cost-reflective retail tariffs would facilitate retail competition, which would be likely to reduce the retail dominance of Synergy. In this context, the Authority noted in the 2008 Minister's Report that the full objectives of the market will not be achieved in a real sense unless Synergy's dominance is reduced. Without more cost-reflective retail tariffs, it was considered likely that Synergy's dominance will become further entrenched.

5.7.7 Authority's view

In regard to regulated tariffs, the Authority reiterates its views in the 2008s Minister's Report that cost-reflectivity of retail tariffs is essential to ensuring the market continues to meet its objectives over time.

The Authority notes that there has been progress on regulated retail tariffs since the 2008 Minister's Report, with regulated retail tariffs increasing on 1 April 2009 and 1 July 2009 by 26 per cent in total. The Authority is also encouraged by the Minister for Energy's announcement on 31 October 2009 of the likelihood that a similar retail tariff increase will occur in 2010. However, the Authority notes that regulated tariffs for small retail customers remain below cost-reflective levels, and that increases in the cost of supplying

[193] See Office of Energy web site, *Western Australian Feed-in Tariff Consultation Summary*, http://www.clean.energy.wa.gov.au/pdf/Western Australian Feed-in Tariff Consultation Summary - Final Version.pdf

[194] ESAA, Landfill Gas and Power, Western Power Networks.

[195] Landfill Gas and Power.

[196] Infratil, Western Power Networks.

electricity due to the CPRS, the expanded RET, and network tariff increases are likely to increase the extent to which tariffs are below cost-reflective levels.

The Authority considers that retail tariffs should be transitioned to cost-reflective levels as quickly as possible.

Recommendation 12

Section 5.7.7

The Authority considers that cost-reflective retail tariffs are essential to ensuring that the Wholesale Electricity Market continues to meet its objectives over time.

The Authority recommends that a clear process for determining regulated retail tariffs on a regular basis be established, with the objective of achieving and maintaining cost-reflective regulated retail tariffs. This process needs to ensure that there are clear arrangements for the direct pass-through of changes in network tariffs to retail tariffs.

In regard to FRC, the Authority's view is that the extent of both generation competition and retail competition will ultimately impact on the extent to which the market is effective in meeting the Wholesale Market Objectives. Until FRC is introduced, retail competition will be constrained, which will limit the effectiveness of the market. For this reason, the Authority is concerned about the suggestion in the Oates Report that FRC should be deferred.

Recommendation 13

Section 5.7.7

The Authority considers that until full retail contestability is introduced, retail competition will be constrained.

The Authority recommends that the costs and benefits of introducing full retail contestability should be assessed and, in the event that full retail contestability is found to have net benefits, a pathway towards the introduction of full retail contestability should be established.

5.8 Vesting contract

5.8.1 Outline in the Discussion Paper

As discussed in previous Minister's Reports, the Vesting Contract is a transitional mechanism to support the development of the market and is designed to roll-off over time. As noted in the Discussion Paper, the displacement mechanism in the Vesting Contract between Verve Energy and Synergy has facilitated significant new investment in generation since market commencement.[197] The Authority noted in the Discussion Paper that a merger of Synergy and Verve Energy would raise questions about the continuation of this tendering process.

5.8.2 Oates Report

The Oates Report took the view that the Vesting Contract creates unnecessary risks for Verve Energy and Synergy and potentially distorts investment decisions. The Vesting Contract contains several features that the Oates Report considered were in need of urgent review. In particular, these are the:

- displacement schedule; and
- netback arrangements.

The displacement schedule effectively requires Synergy to enter long term contracts with generators to hedge its wholesale power purchases as the Vesting Contract coverage of this capacity rolls off. Under most of these contracts, Synergy bears the risk of underwriting generators' investments. However, to the extent that Synergy is increasingly exposed to retail market competition over time, the Government will effectively bear the commercial risks of new plant investments. These risks will increase significantly if and when FRC is introduced.[198] The rapid displacement schedule also gives rise to the risk that Verve Energy will be left with excess capacity that is uncontracted if Verve Energy is unsuccessful in a tender. Thus the risk of excess capacity in the market is imposed on Verve Energy.[199]

According to the Oates Report, the displacement schedule should be amended so that Verve Energy's supply to Synergy is contracted without prescribed displacement below the level of Synergy's price-protected market. Any move towards FRC would then be accompanied by a dropping away of the Vesting Contract quantities to match the reduction in Synergy's price-protected load.[200]

Under the netback provisions in the Vesting Contract, Verve Energy is paid the residual funds after Synergy has collected its tariff revenue from customers, paid network charges to Western Power Networks and retained its 'efficient' operating costs plus an allowed margin.[201] As such, the risks that were borne by Synergy are transferred to Verve Energy.[202] The Oates Report observed that the netback arrangement is the mechanism whereby almost the entire variance between network and wholesale electricity costs on the one hand and electricity retail tariffs on the other are passed through to Verve

[197] The Vesting Contract's displacement mechanism requires Synergy to tender for capacity and energy to replace the capacity and energy provided under the Vesting Contract.

[198] Oates Report, p.26.

[199] Oates Report, p.33.

[200] Oates Report, p.42.

[201] Oates Report, p.17.

[202] Oates Report, p.31.

Energy.[203] Ultimately, according to the Oates Report, the Vesting Contract would ideally be replaced by a Bilateral Contract arrangement in which Verve Energy was paid a benchmarked competitive price for wholesale energy. Until then, Synergy and Western Power Networks should provide timely monthly information and forecasts to Verve Energy to help ensure there is timely pass-through to Verve Energy of increases in retail tariffs and the special State subsidy.[204]

5.8.3 Submissions in response to the Discussion Paper

One stakeholder contended that it considers the Vesting Contract between Verve Energy and Synergy should be re-priced on commercial terms to fully reflect the cost of production.[205]

5.8.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority noted that the Vesting Contract was a transitional mechanism to support the development of the market and would roll off gradually over time. The displacement schedule was intended to provide scope for other generators to enter contracts with Synergy in order to promote competition in the generation sector.[206]

The 2008 Minister's Report also highlighted some perverse behaviour by Synergy in relation to the Vesting Contract. However, this was addressed by modifications to the contract made by the Office of Energy.[207]

5.8.5 Authority's view

The Authority concurs with the view expressed in the Oates Report that the Vesting Contract should be priced at commercial levels so that any subsidies required to provide Synergy with a reasonable (benchmarked) retail margin are transparent (rather than being provided through favourable pricing under the Vesting Contract). Under these conditions, Verve Energy would have greater certainty regarding its revenues than under the existing netback arrangements and Synergy would face stronger incentives to minimise its costs of retailing.

The Authority considers that the displacement schedule under the Vesting Contract is important to foster both competition at the generation level and new generation entry. While the displacement schedule undoubtedly creates risk for the Government-owned businesses, the Authority considers that this is a reflection of the forces of competition that affect all businesses that operate in a market. To the extent that the displacement schedule subjects Verve Energy to the risks of being left with excess capacity, it should be able to manage this risk by offering to enter into competitively-priced independent contracts with Synergy and other retailers outside the Vesting Contract. For this reason, the Authority recommends that the displacement of the Vesting Contract should continue, regardless of the timing of the introduction of FRC.

[203] Oates Report, p.24.

[204] Oates Report, p.43.

[205] Infratil.

[206] 2008 Minister's Report, p.72.

[207] 2008 Minister's Report, p.73.

Recommendation 14

Section 5.8.5

The Authority considers that the displacement schedule under the Vesting Contract is important for fostering competition in the Wholesale Electricity Market.

For this reason, the Authority recommends that the displacement schedule under the Vesting Contract should proceed as originally planned, so that any contractual arrangements between Verve Energy and Synergy move to commercially negotiated bilateral arrangements.

5.9 Market structure

5.9.1 Outline in the Discussion Paper

As noted in the Discussion Paper, during informal stakeholder consultations the vast majority of parties expressed serious concerns about a merger of Verve Energy and Synergy and about new generation investment by Government and/or Verve Energy. Some stakeholders specifically raised concerns about the potential breach of the 3,000 MW cap on Verve Energy's generation capacity and commented that they were concerned about the impact of these proposals on further private sector investment opportunities in the WEM. The Discussion Paper also observed that the displacement mechanism in the Vesting Contract between Verve Energy and Synergy – which requires Synergy to tender for capacity and energy to replace the capacity and energy provided under the Vesting Contract – has facilitated significant new investment in generation since market commencement. A merger of Verve Energy and Synergy would raise questions about the continuation of this tendering process.

Finally, the Discussion Paper highlighted that evidence from other electricity markets suggests that the ongoing success of the market, particularly in delivering benefits to end-users, depends on competition in both the generation and retail sectors.

5.9.2 Oates Report

As noted in Section 5.8.2, the Oates Report is highly critical of the existing displacement schedule, recommending that it be changed so that Verve Energy's supply to Synergy under the Vesting Contract does not fall below the level of Synergy's price-protected market. Any move towards FRC would then be accompanied by a corresponding rolling off of the Vesting Contract quantities in line with the reduction in Synergy's price-protected load.[208]

The key task of the Oates Report was to compare options for the structural reform of Verve Energy and Synergy, including a merger and the retention of separate entities. The report found that both options could – at least in theory – be consistent with a high level of operating efficiency. Competition could lead to high levels of operating efficiency so long

[208] Oates Report, p.42.

as the level of competition was genuine. However, the Oates Report also contended that a well-run monopoly could also achieve high levels of operating efficiency if subject to very effective regulation and strong performance management frameworks.

The Oates Report found that the main issues differentiating the options were longer-term system-wide cost efficiency and the level of support provided to the industry by the State, as well as the degree of direct control the State wants over future investment decisions and operations across the sector. In this context, a merger would ultimately give the State greater control over the industry but would be expected to reduce competition and result in a greater level of State sponsorship and risk capital support. By contrast:

> Retaining separate entities and adopting policies which promote increased retail competition while maintaining an environment where wholesale competition is becoming effective should, in the medium term at least, provide for an ongoing reduction in the level of State sponsorship and risk capital support – while providing a security mechanism for procuring capacity in the currently constrained capital market.[209]

The Oates Report went on to recommend various steps that ought to be taken to support each structural option, as well as actions required irrespective of structure.[210]

5.9.3 Submissions in response to the Discussion Paper

Several stakeholders commented that a merger between Verve Energy and Synergy would harm generation and retail competition in the WEM and deter investment by new entrants.[211]

Stakeholders also remarked that structural arrangements created as part of the implementation of the WEM – such as the separation of Verve Energy and Synergy and the 3,000 MW cap on Verve Energy's capacity – have been critical to new generation entry and have been effective in promoting reliable and secure electricity supply.[212] One stakeholder commented that the recent decision by Government to provide Verve Energy with funding to invest in new generation capacity increases the sovereign risk for private sector investment, with implications for future investment decisions.[213]

5.9.4 Review of Recommendations and Findings from the 2008 Minister's Report

In the 2008 Minister's Report, the Authority observed that retail and generating activities within the WEM are currently dominated by Synergy and Verve Energy, respectively. This concentrated structure has led to a quasi-bilateral monopoly market structure in the WEM, which was likely to reinforce the barriers to new entry resulting from non-cost reflective tariffs and the absence of FRC.

In addition, the Authority noted that the Government was considering a merger of Verve Energy and Synergy. The Authority considered that such a merger – which would deter new entry into both generation and retailing – would compound the existing distortions at the wholesale and retail levels of the market.[214] Ultimately, the existence of such a

[209] Oates Report, p.48.

[210] Oates Report, pp.50-52.

[211] ESAA, Infratil, Landfill Gas and Power, Perth Energy.

[212] Alinta, Extension Hill.

[213] Alinta.

[214] 2008 Minister's Report, pp.74-75.

dominant 'gentailer' in the WEM would destroy effective competitive tension in the market with adverse impacts on efficiency.

5.9.5 Authority's view

As noted above in Section 1.3.3, the Minister for Energy announced on 26 August 2009 that the Government would not remerge Verve Energy and Synergy.[215] The Authority welcomes this decision for the reasons given in the 2008 Minister's Report – namely that a merger would undermine competition by deterring the entry of new generator and retailer participants in the WEM as well as undermining private investment in new generation facilities. Ultimately, Western Australian electricity customers and taxpayers would bear the risks and costs of a shift back to a vertically integrated electricity monopoly. Contrary to the view expressed in the Oates Report, the Authority does not consider that a vertically integrated structure could produce equivalent levels of operating efficiency as a competitive market. Evidence from both Australia and around the world across a range of utility sectors has demonstrated that the extent of information asymmetries between monopoly utilities and regulators is such that competition almost always delivers superior outcomes to regulation in terms of both operational performance and, more importantly, the dynamic efficiency of investment type, timing and location.

Despite the decision not to remerge Verve Energy and Synergy, the Minister for Energy's press release referred to the need to make significant changes to the Market Rules and the Vesting Contract to address Verve Energy's financial problems. The Authority is concerned that these changes should not amount to a de facto merger, or otherwise reduce opportunities for new private sector participation in the WEM. This concern relates particularly to any modification to the existing displacement schedule, as proposed in the Oates Report. The Authority looks forward to greater clarity regarding the Government's intentions for the contractual arrangements between Verve Energy and Synergy. In the meanwhile, the Authority will continue to work with all stakeholders for a more competitive and efficient market for electricity.

The Authority also considers that restrictions imposed on Verve Energy and Synergy with the introduction of the WEM – including the 3,000 MW cap on Verve Energy's generation capacity – are important for the development of competition in the market. The Authority considers that a relaxation of these restrictions would deter further investment by independent generators.

Finding 3

Section 5.9.5

The Authority considers that a relaxation of the 3,000 MW cap on Verve Energy's generation capacity would deter further investment in generation capacity by independent generators, to the detriment of the Wholesale Electricity Market.

[215] See the Minister for Energy's press release.

5.10 Road map

5.10.1 Outline in the Discussion Paper

In the Discussion Paper, the Authority noted that it had proposed a 'road map' process to address various outstanding market design issues in the 2008 Minister's Report.

The Authority also noted in the Discussion Paper that it understood that the Office of Energy had included an electricity market road map task in the draft Operational Plan for its Markets and Regulatory Policy Division, but that commencement of this work was subject to the availability and operational prioritisation of funding and staff. The Authority also noted that the IMO had offered support and resources to assist the Office of Energy.

5.10.2 Submissions in response to the Discussion Paper

ESAA commented that it considers it is important that a long-term, whole-of-supply chain State energy policy is developed to establish the context for market evolution and to underpin the development of an efficient and effective energy market for Western Australia. ESAA suggested that the interaction of the network access process and the RCM to promote efficient investment should form part of this road map process. On ESAA's view it is important, however, that the full costs and benefits of any market changes be considered, so as not to undermine the investment certainty arising from a stable market design.

Western Power Networks commented that it strongly supports the road map process being developed under the Office of Energy's leadership.

5.10.3 Review of Recommendations and Findings from the 2008 Minister's Report

The proposal for a strategic road map had its genesis in the 2008 Minister's Report. The original purpose of the road map was to examine and help resolve a range of fundamental market design issues so that the WEM could more effectively meet its objectives as the market evolved. These issues included:

- the appropriateness of the continued use of an unconstrained approach to network planning and connections;
- moving to a market-determined capacity price;
- moving the STEM closer to real-time or adopting multiple gate closures;
- the appropriateness of separate liquid and non-liquid STEM price caps to prevent market manipulation;
- the removal of STEM SRMC bidding rules and maximum prices;
- the desirability of moving towards a single maximum STEM price;
- the introduction of competitive Balancing;
- the appropriate institutional allocation and location of responsibilities of system management, network management and market operation; and
- for the longer term, consideration of the merits of an energy-only market.

The Authority recommended that the direction, shape and timing of the road map should be driven by the Office of Energy.

5.10.4 Authority's view

The Authority considers that there are a number of market evolution issues that need to be progressed in order to address major challenges facing the WEM. With multiple reviews and processes currently underway, the Authority considers that there is potential for uncertainty among stakeholders as to how these issues will be progressed.

As set out in Section 1.4 and elsewhere in this report, the Authority reiterates its view from its 2008 Minister's Report that there needs to be a process put in place to lay out a strategy for the future development of the WEM (being the WEM Future Strategy), which further promotes the Wholesale Market Objectives. The Authority is strongly of the view that this WEM Future Strategy should be based on a transparent and consultative process that is coordinated by the Office of Energy, so that the consideration of any changes (consistent with the Wholesale Market Objectives) are at 'arm's length' from the perspective of State Government, i.e. they are not formulated in isolation by the Government. Where matters are of sufficient importance to warrant Government decisions, these decisions should be based on recommendations developed through the WEM Future Strategy.

APPENDICES

Appendix 1 Glossary of acronyms

AEMC	Australian Energy Market Commission
AQP	Application and Queuing Policy
CCRC	Conditional Certified Reserve Capacity
CPRS	Carbon Pollution Reduction Scheme
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DDAP	Downwards Deviation Administered Price
DSM	Demand Side Management
ECRC	Early Certified Reserve Capacity
ESAA	Energy Supply Association of Australia
FRC	Full retail contestability
IMO	Independent Market Operator
MAC	Market advisory committee
MCAP	Marginal Cost Administered Price
MCE	Ministerial Council on Energy
MRCP	Maximum Reserve Capacity Price
MSDC	Market Surveillance Data Catalogue
MW	Megawatt
MWh	Megawatt Hour
NEL	National Electricity Law
NEM	National Electricity Market
NFIT	New Facilities Investment Test
RCM	Reserve Capacity Mechanism
RCP	Reserve Capacity Price
REGWG	Renewable Energy Generation Working Group
RET	Renewable Energy Target
SCADA	Supervisory Control and Data Acquisition
SRMC	Short run marginal cost
STEM	Short Term Energy Market

SWIN	South West Interconnected Network
SWIS	South West Interconnected System
UDAP	Upwards Deviation Administered Price
WEM	Wholesale Electricity Market

Appendix 2 Submissions received in response to the Discussion Paper

Alinta Sales Pty Ltd

Energy Supply Association of Australia

Extension Hill Pty Ltd

Independent Market Operator

Infratil Limited

Landfill Gas and Power

Perth Energy Pty Ltd

Synergy

System Management

Western Power

Verve Energy

Appendix 3 Market Surveillance Data Catalogue summary

STEM price duration curves and MCAP duration curves

Figure 29: Price duration curves during off-peak periods (1 August 2007 to 31 July 2008)

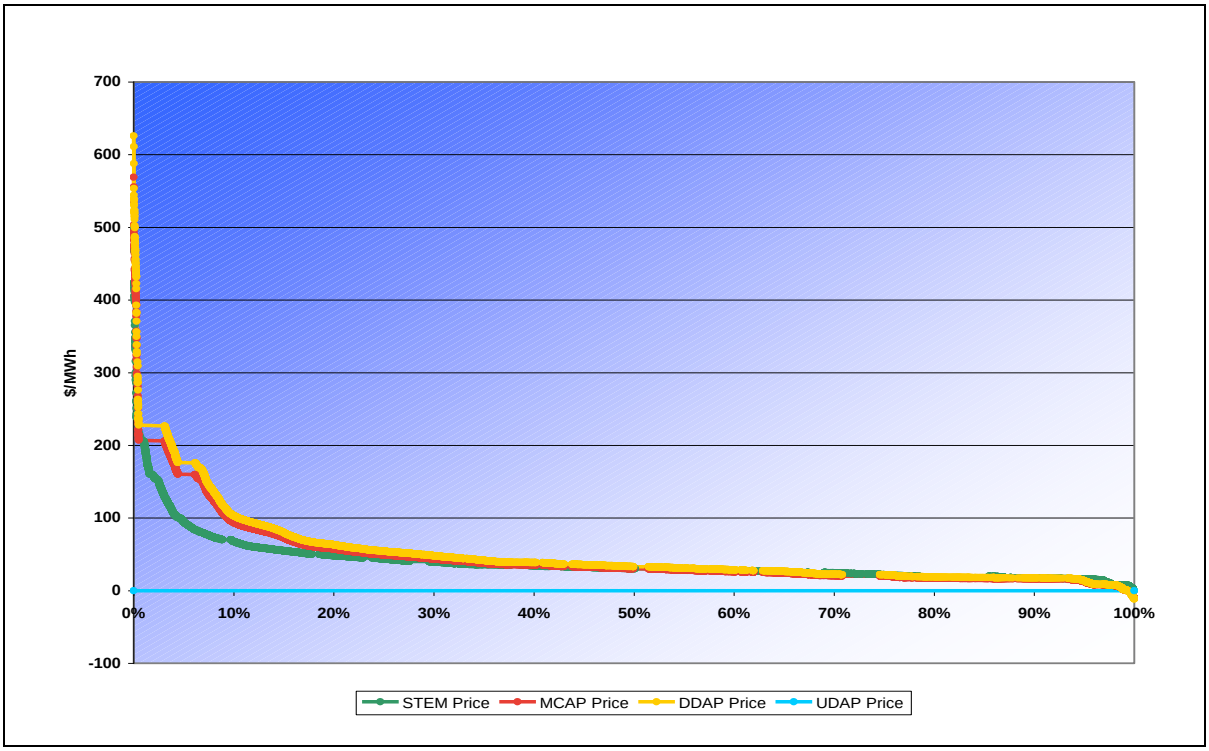
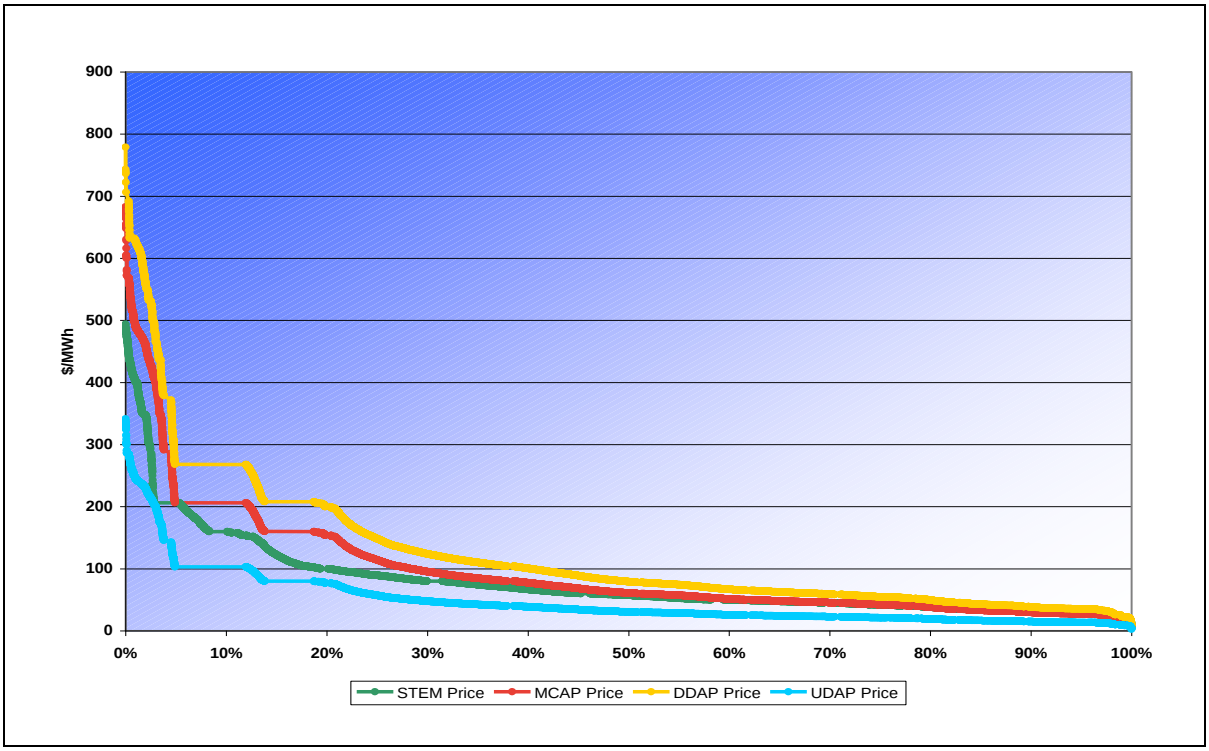
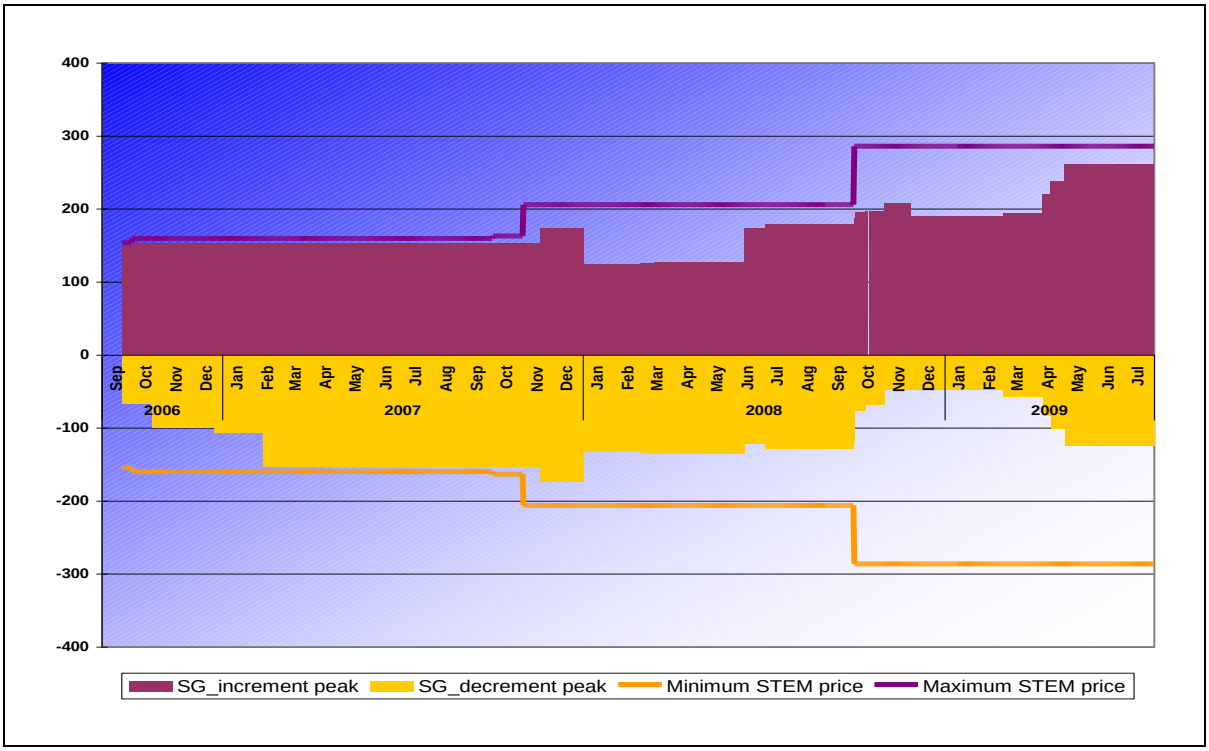


Figure 30: Price duration curves during peak periods (1 August 2007 to 31 July 2008)



Standing Data prices used in Balancing

Figure 31: Average daily Standing Data Balancing prices for Non-Liquid Fuel facilities (peak)[216]



[216] Average daily Standing Data Balancing prices during peak and off-peak intervals are equal, or less than $0.50/MWh different for both increment and decrement. Since the magnitude of any difference is so small, only peak period have been presented.

Figure 32: Average daily Standing Data Balancing prices for Liquid Fuel facilities[217]

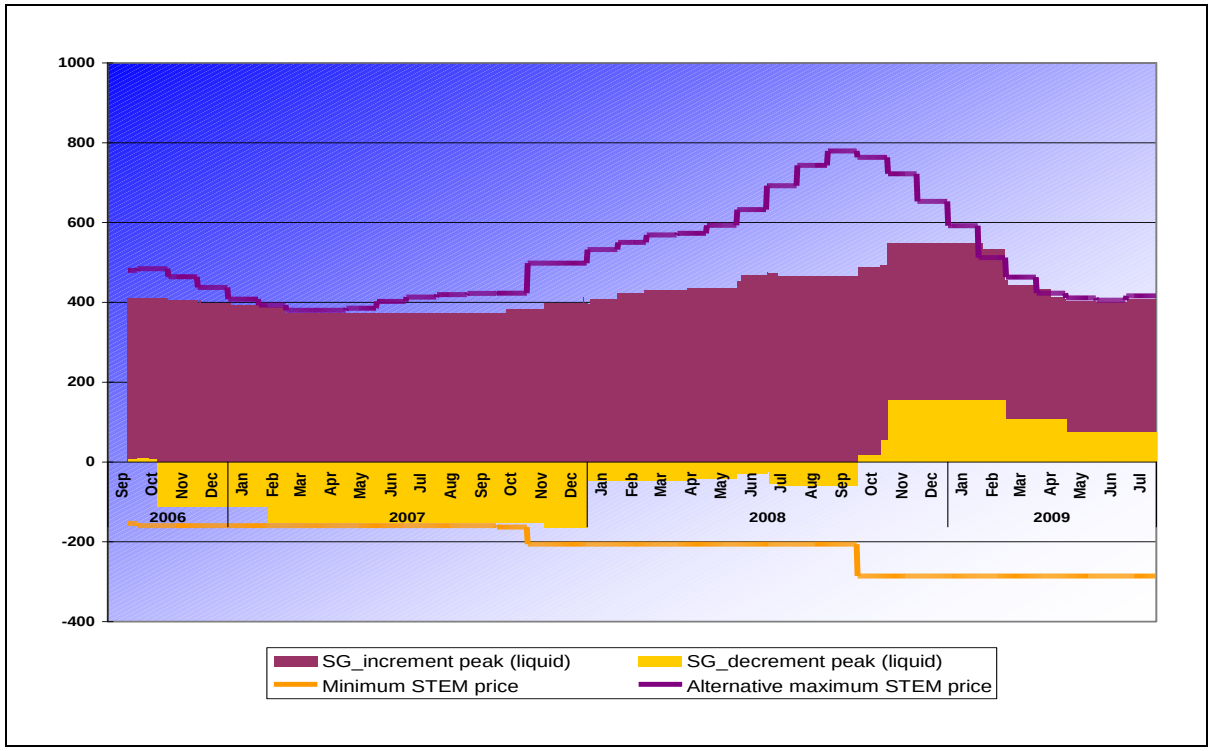
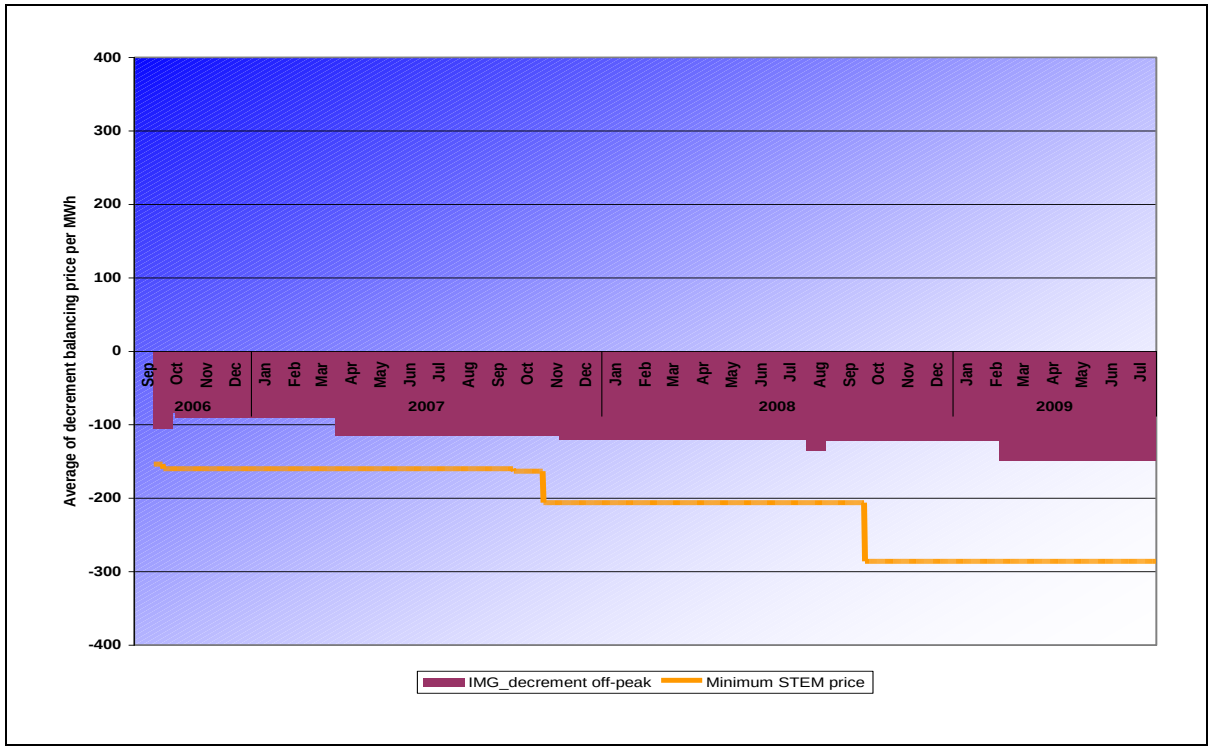


Figure 33: Average daily Standing Data Balancing prices for Intermittent Generators (off-peak)



[217] Average daily Standing Data Balancing prices during peak and off-peak intervals are equal, or less than $0.50/MWh different for both increment and decrement. Since the magnitude of any difference is so small, only peak period have been presented.

Figure 34: Average daily Standing Data Balancing prices for Intermittent Generators (peak)

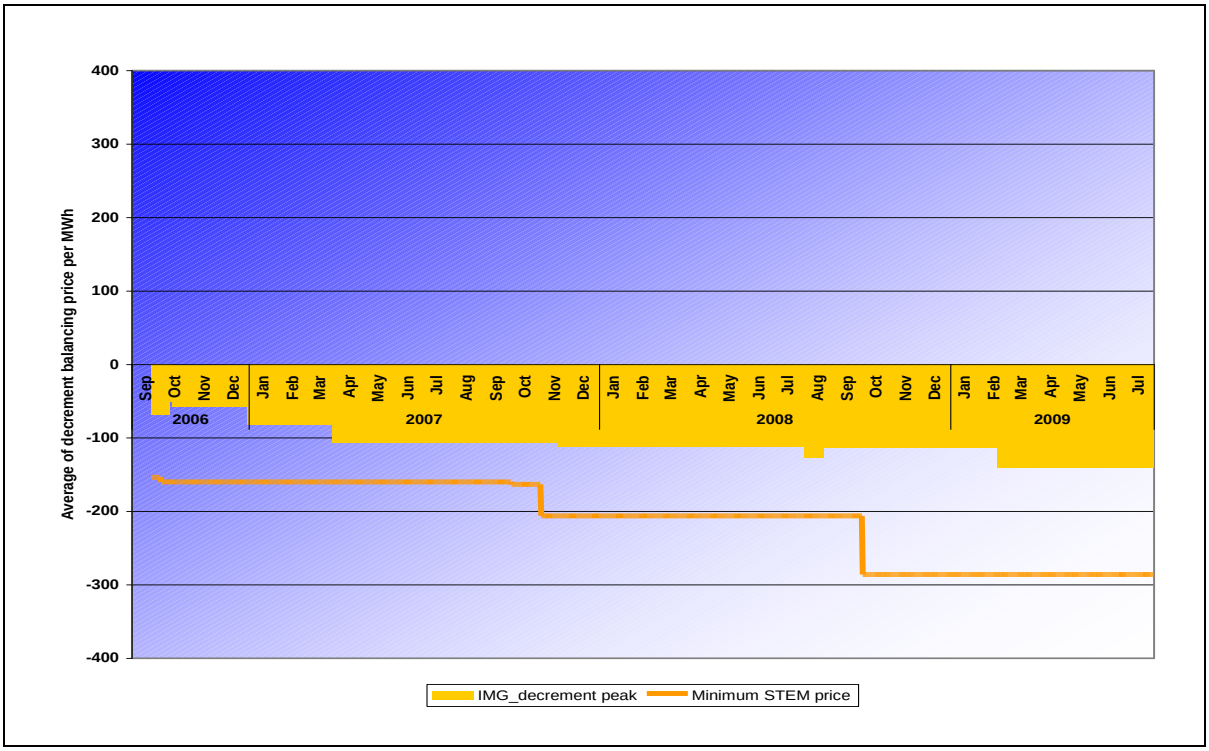
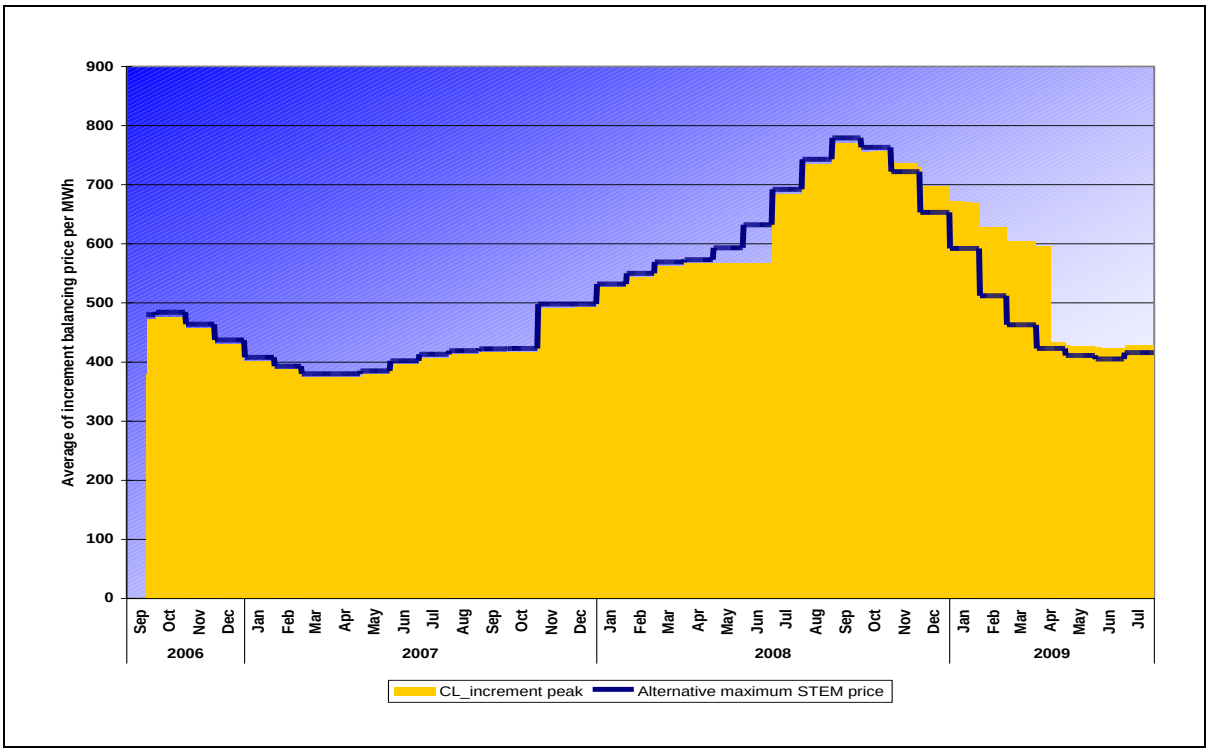


Figure 35: Average daily Standing Data Balancing prices for Curtailable Loads [218] [219]



[218] Average daily Standing Data Balancing prices during peak and off-peak intervals are equal, or less than $0.50/MWh different for both increment and decrement. Since the magnitude of any difference is so small, only peak period have been presented.

[219] In this Figure, for consistency with the other Figures relating to Standing Data Balancing prices, a reduction in Curtailable Loads is represented as an 'increment' of energy.

Volatility of Balancing prices

Figure 36: Summary statistics for MCAPs during Off-Peak Trading Intervals, by month

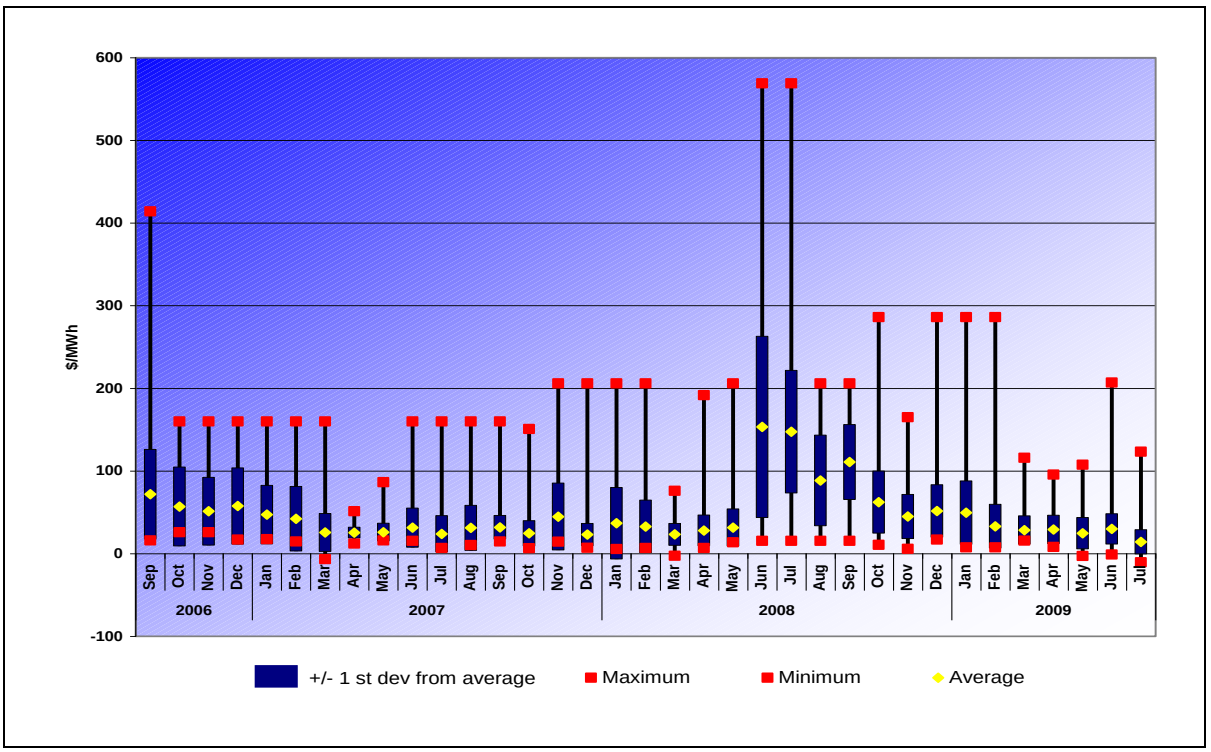


Figure 37: Summary statistics for MCAPs during Peak Trading Intervals, by month

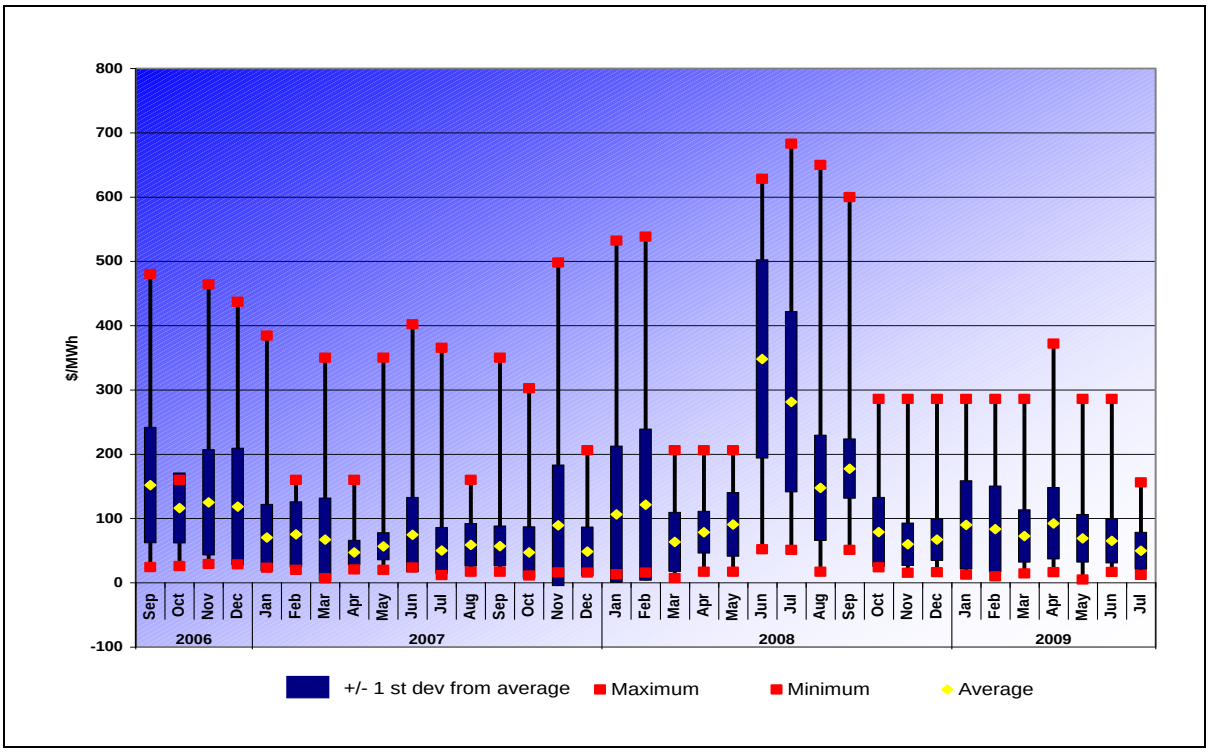


Figure 38: Summary statistics for DDAPs during Off-Peak Trading Intervals, by month

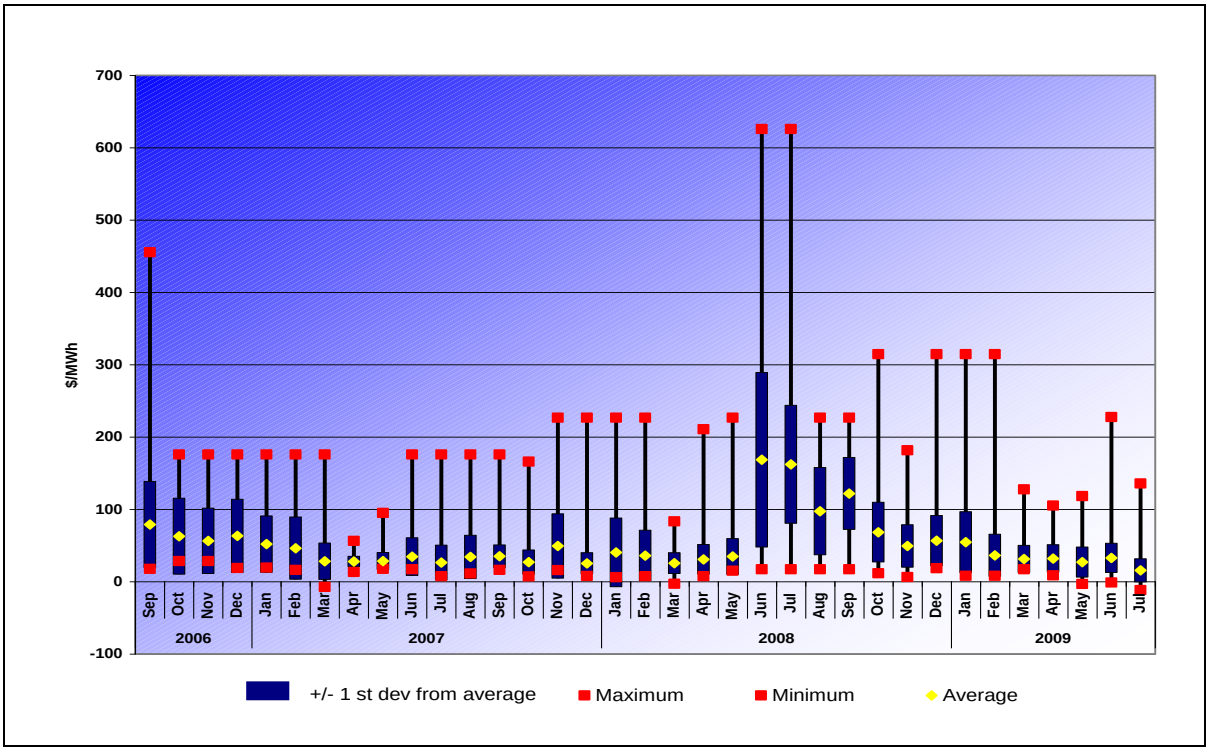


Figure 39: Summary statistics for DDAPs during Peak Trading Intervals, by month

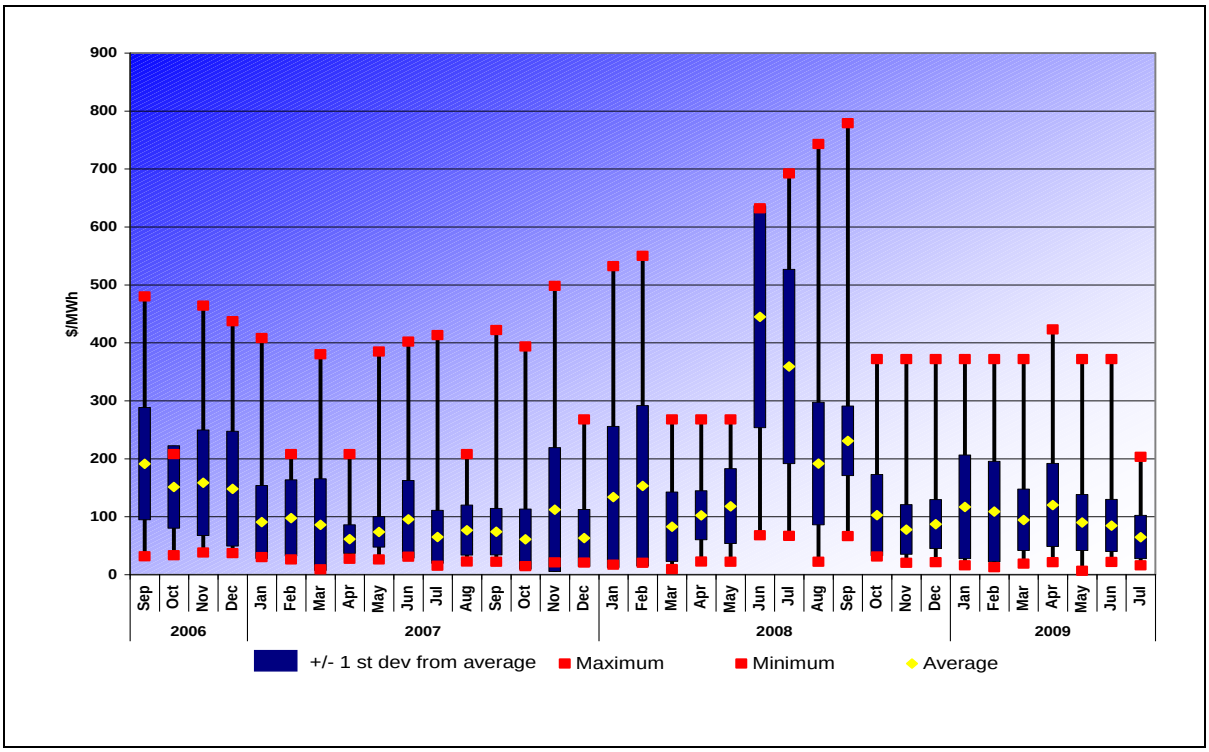
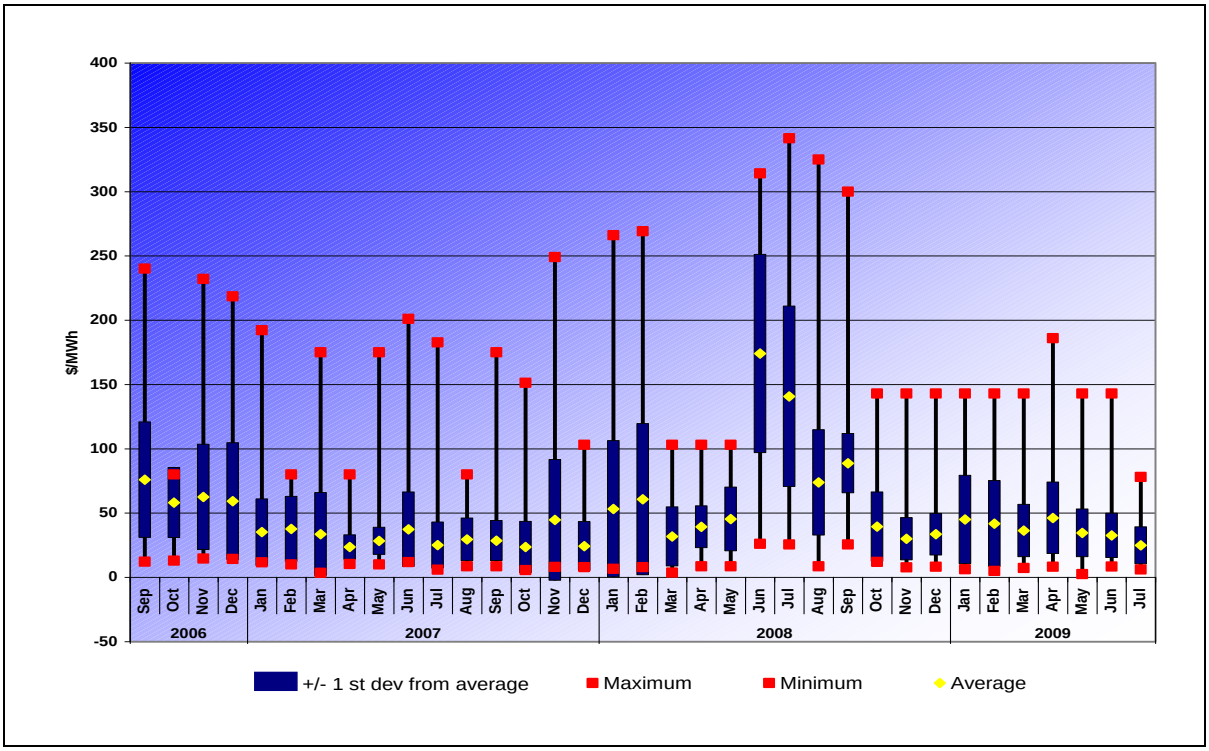


Figure 40: Summary statistics for UDAPs during Peak Trading Intervals, by month[220]



[220] No summary statistics for UDAPs during off-peak trading intervals are presented because the Market Rules specify that UDAP is equal to zero during off-peak trading intervals.

STEM Offers and Bids

STEM Offers

Figure 41: Alcoa's daily average STEM Offers (cumulative MWh per Trading Interval)

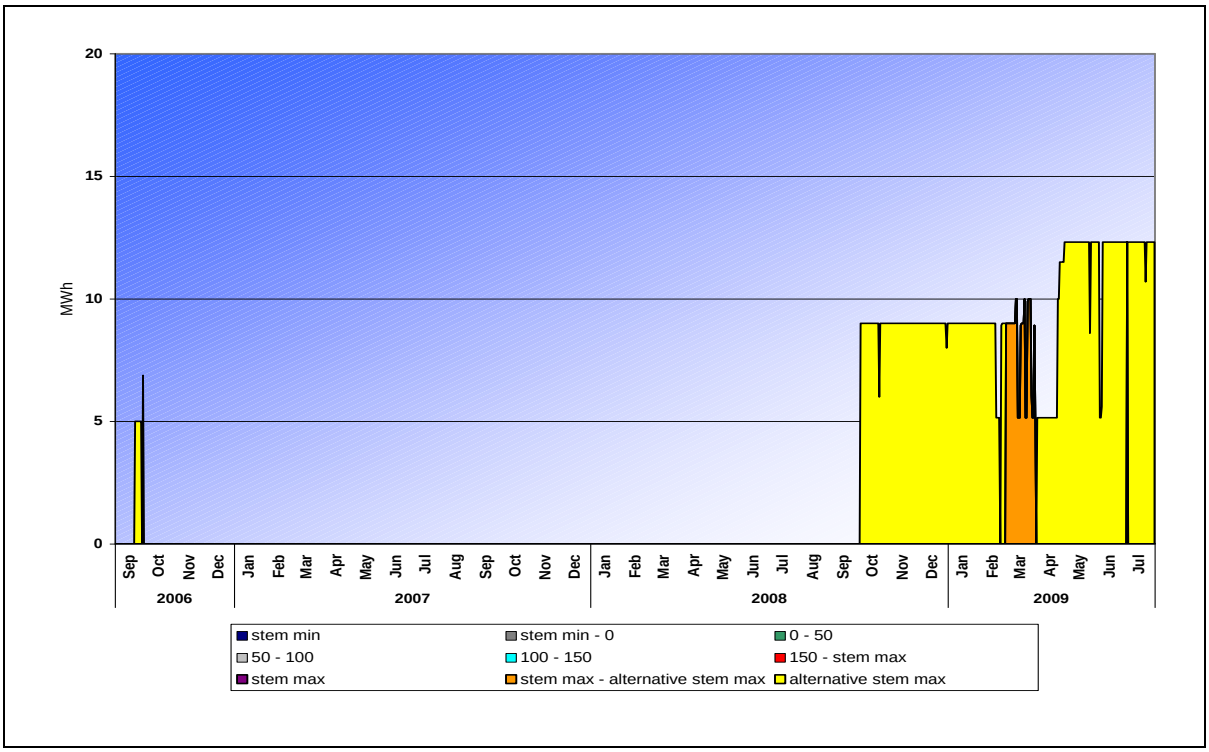


Figure 42: Alinta's daily average STEM Offers (cumulative MWh per Trading Interval)

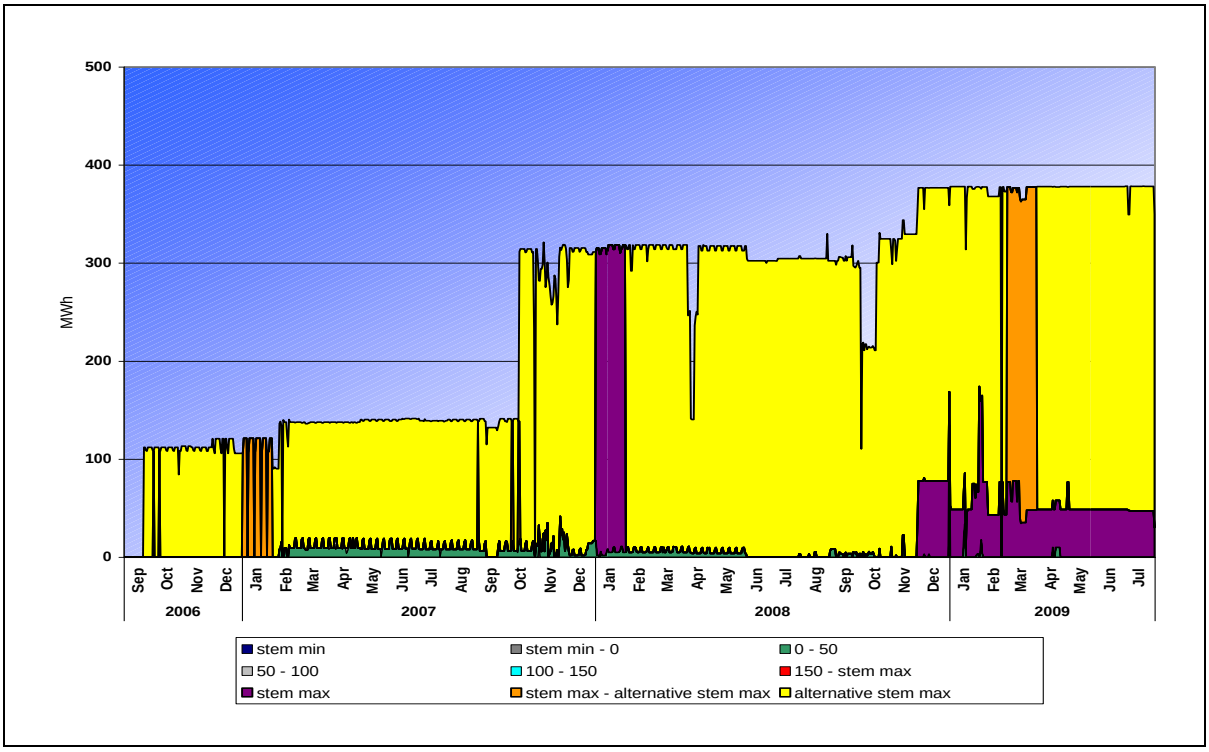


Figure 43: Goldfields Power's daily average STEM Offers (cumulative MWh per Trading Interval)

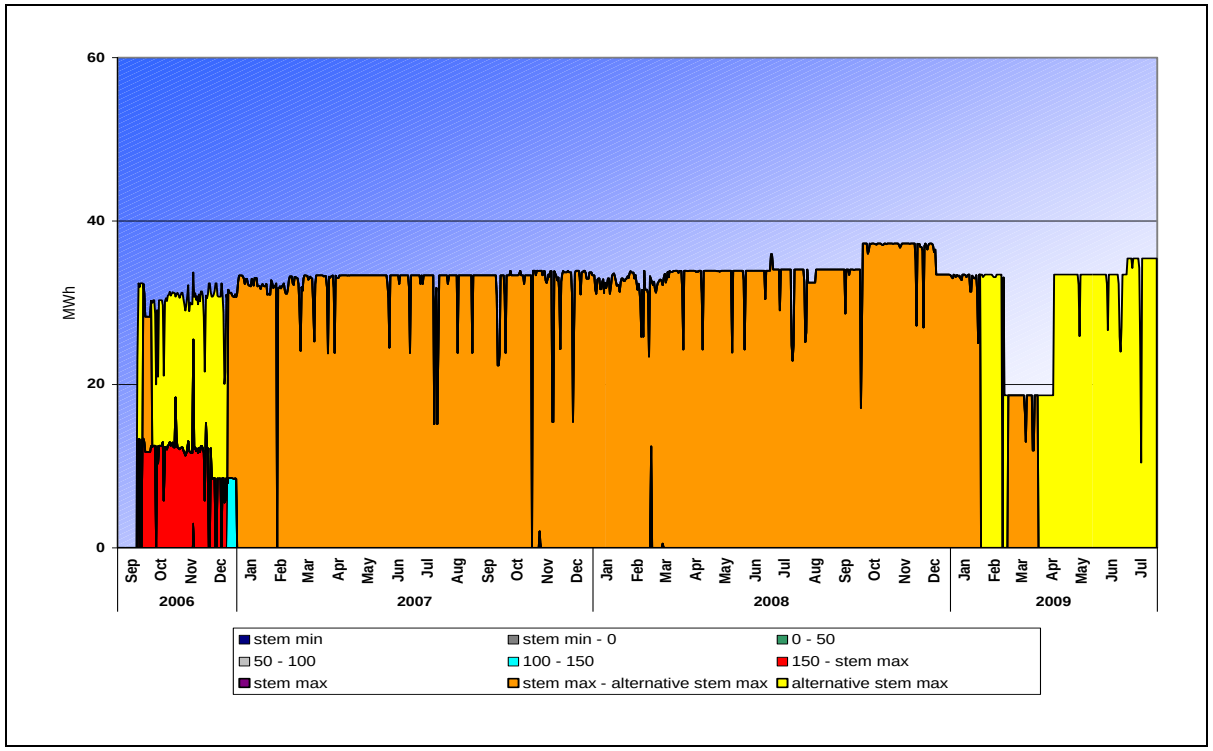


Figure 44: Griffin Power's daily average STEM Offers (cumulative MWh per Trading Interval)

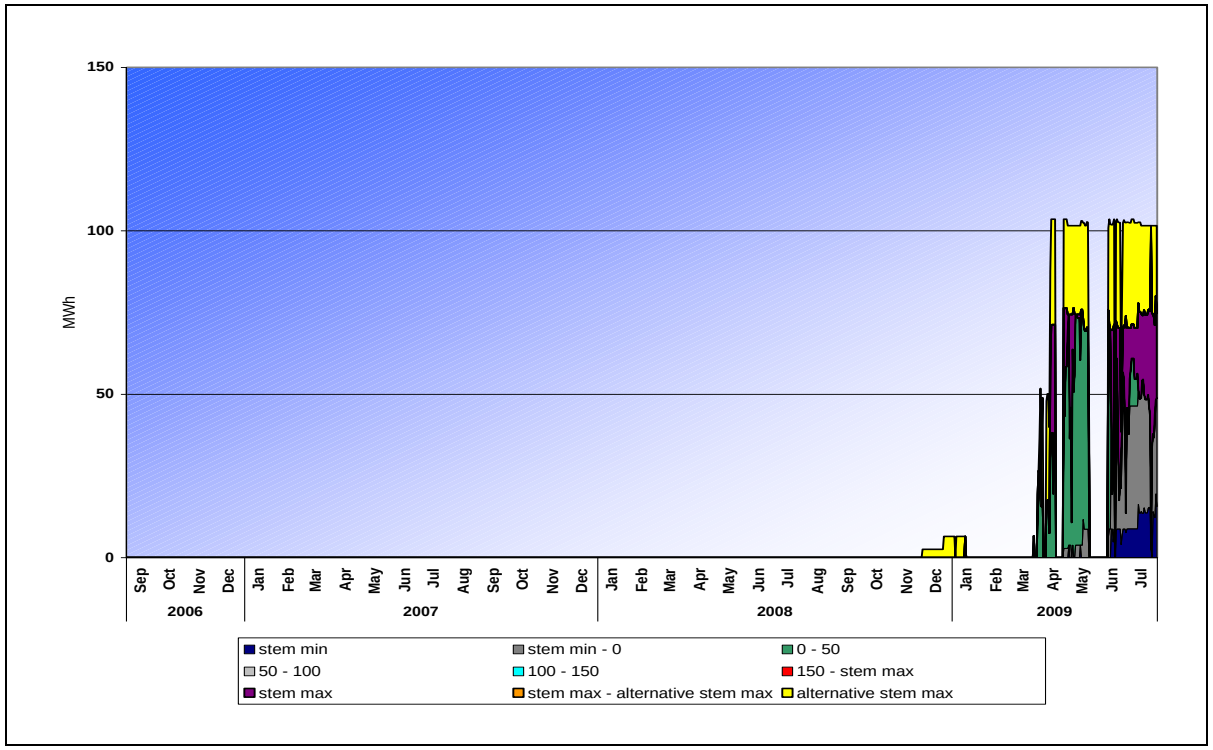


Figure 45: NewGen's daily average STEM Offers (cumulative MWh per Trading Interval)

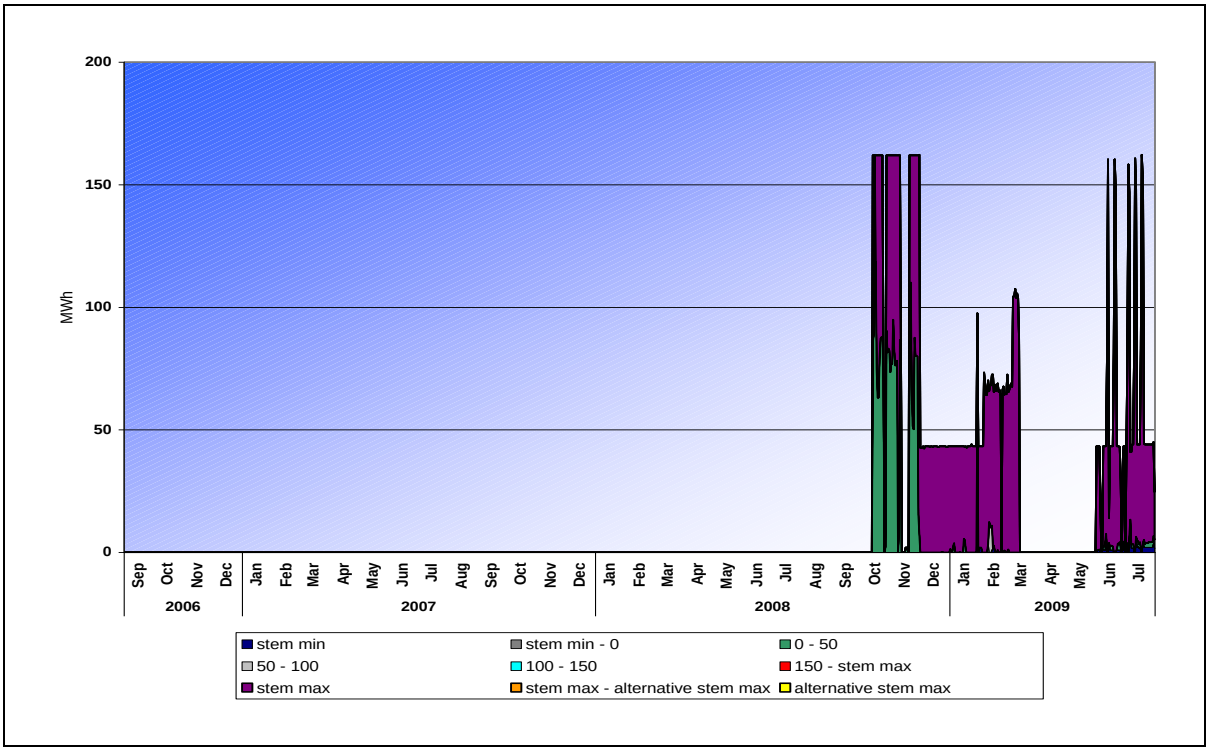


Figure 46: Perth Energy's daily average STEM Offers (cumulative MWh per Trading Interval)

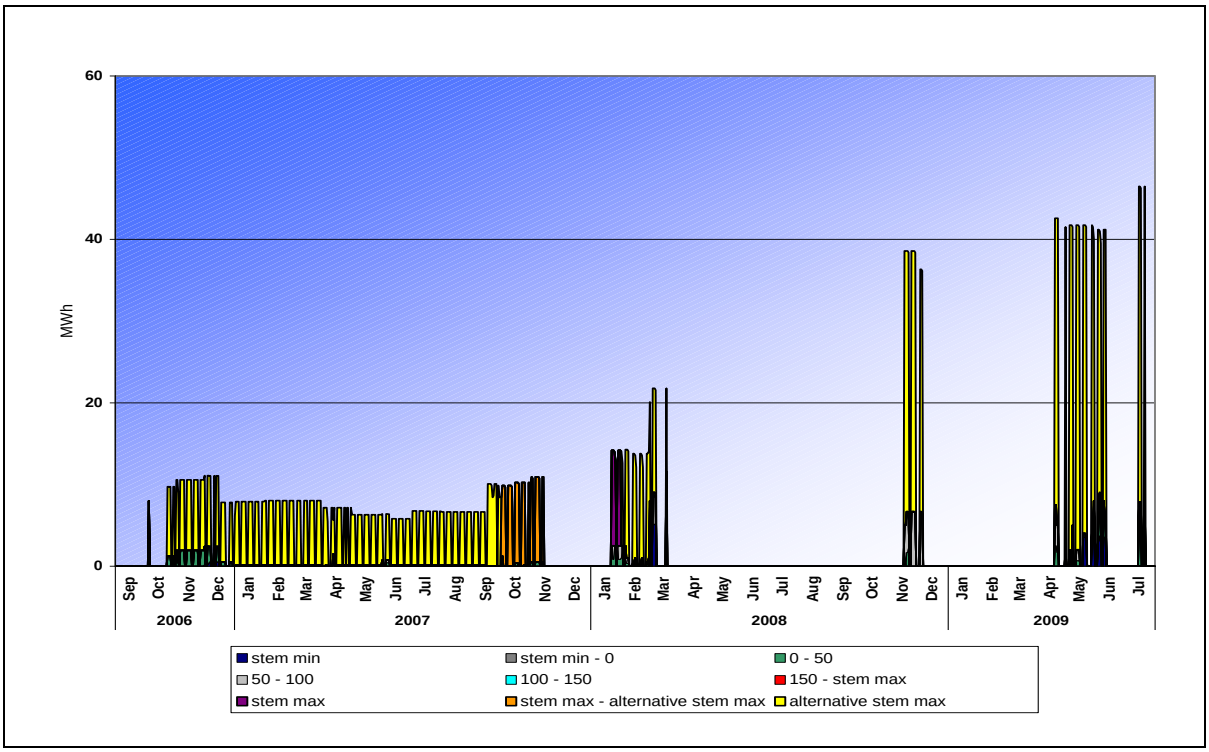


Figure 47: Southern Cross Energy's daily average STEM Offers (cumulative MWh per Trading Interval)

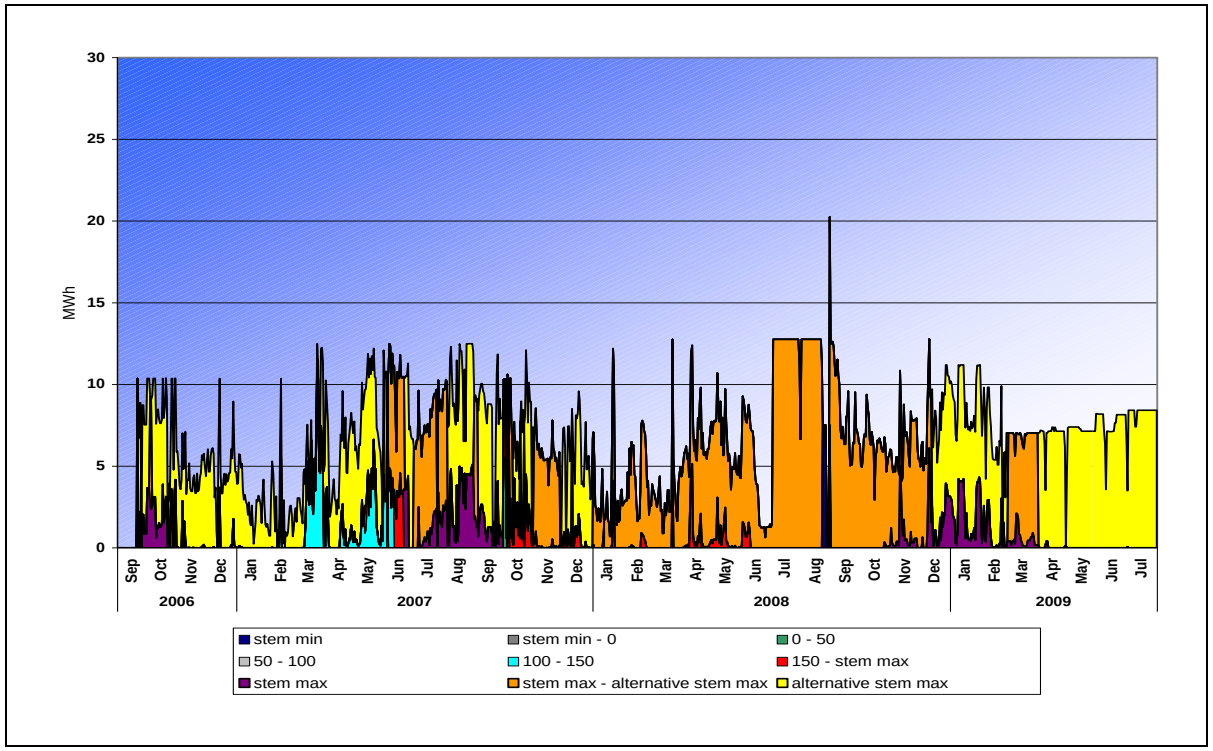


Figure 48: Synergy's daily average STEM Offers (cumulative MWh per Trading Interval)

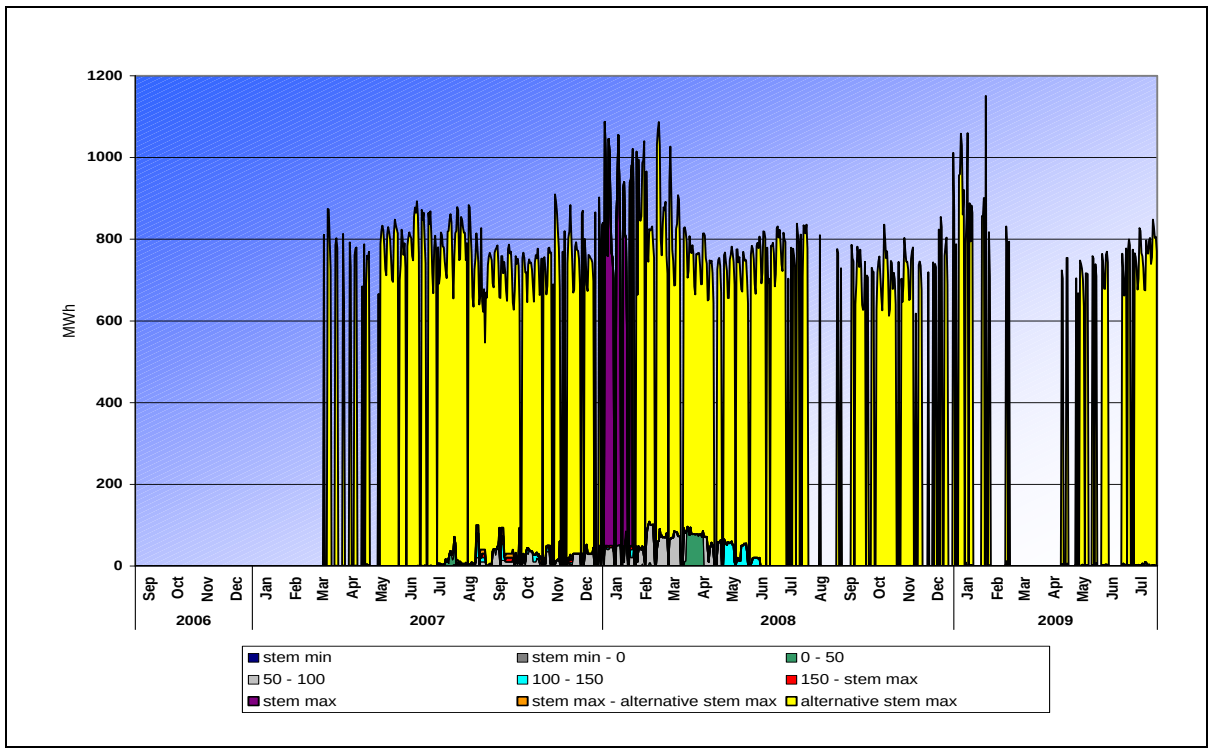
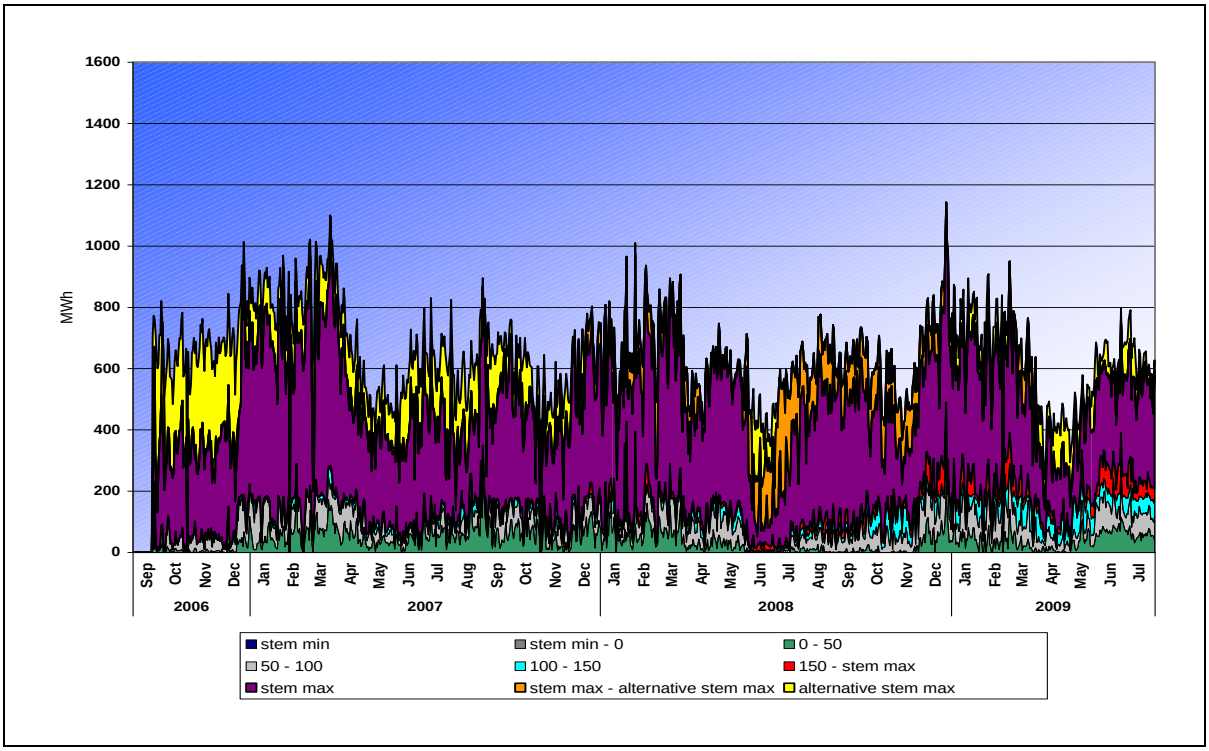


Figure 49: Verve Energy's daily average STEM Offers (cumulative MWh per Trading Interval)



STEM Bids

Figure 50: Alcoa's daily average STEM Bids (cumulative MWh per Trading Interval)

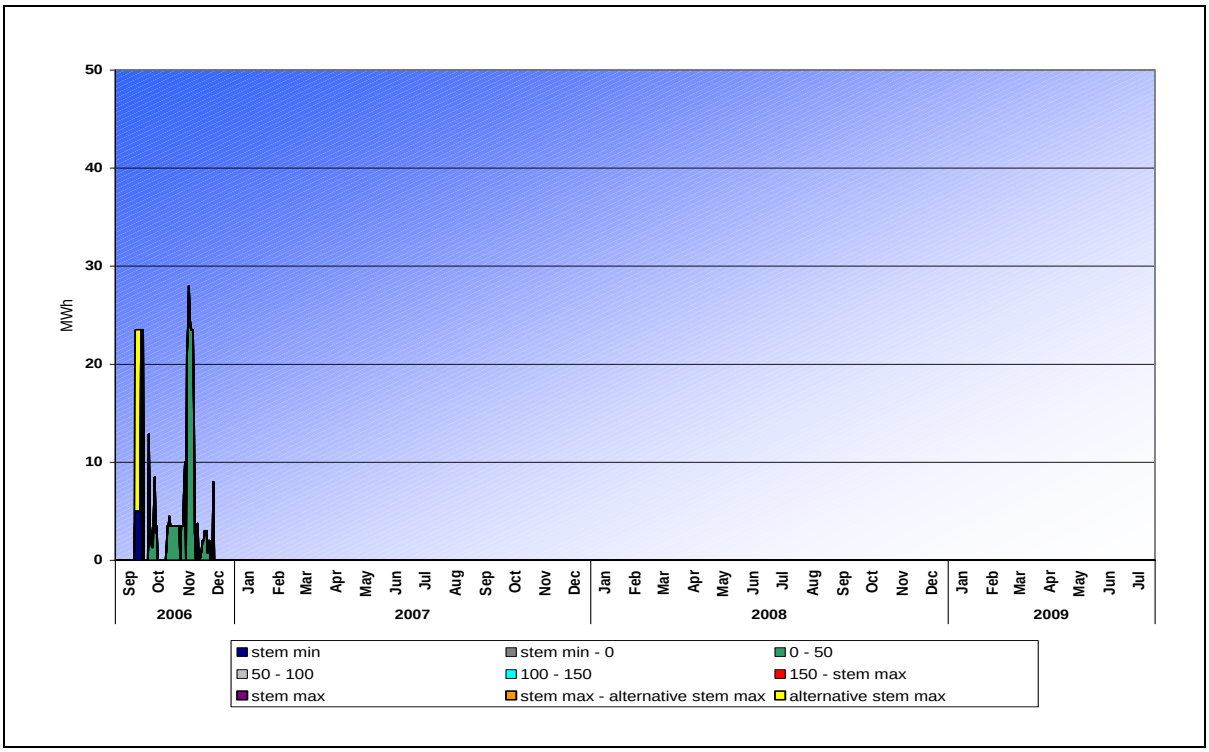


Figure 51: Alinta's daily average STEM Bids (cumulative MWh per Trading Interval)

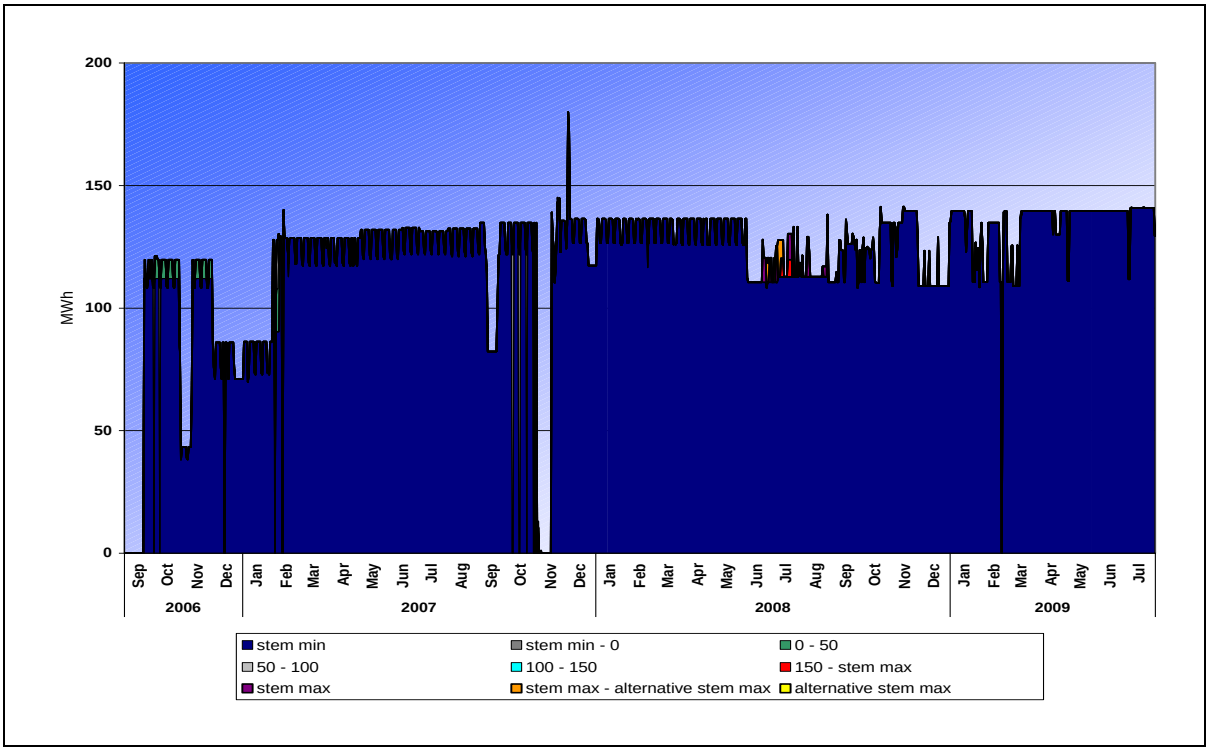


Figure 52: Goldfields Power's daily average STEM Bids (cumulative MWh per Trading Interval)

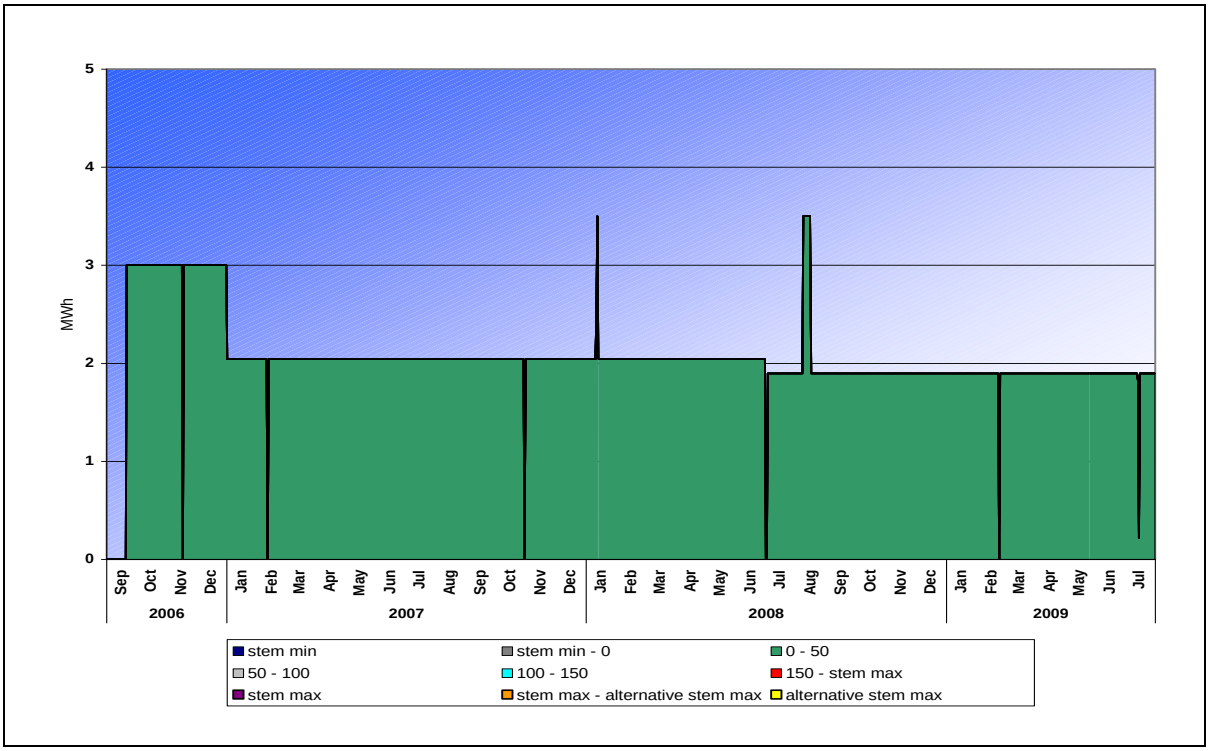


Figure 53: Griffin Power's daily average STEM Bids (cumulative MWh per Trading Interval)

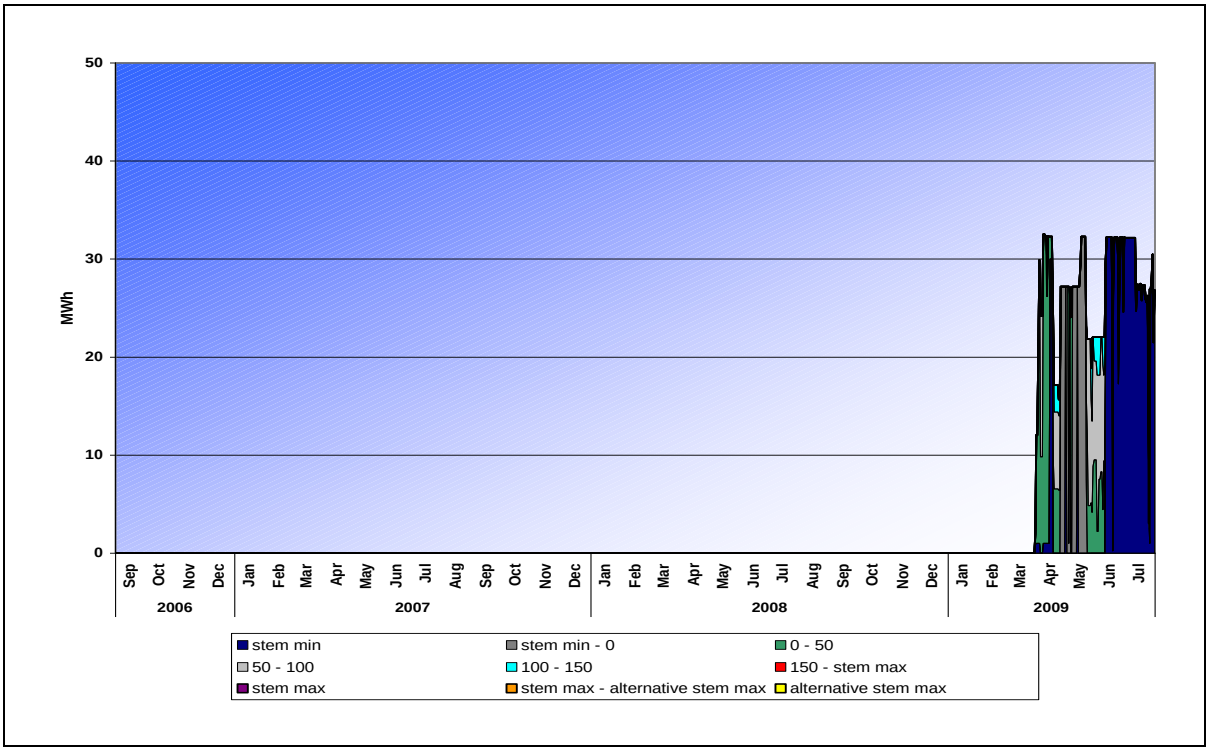


Figure 54: NewGen's daily average STEM Bids (cumulative MWh per Trading Interval)

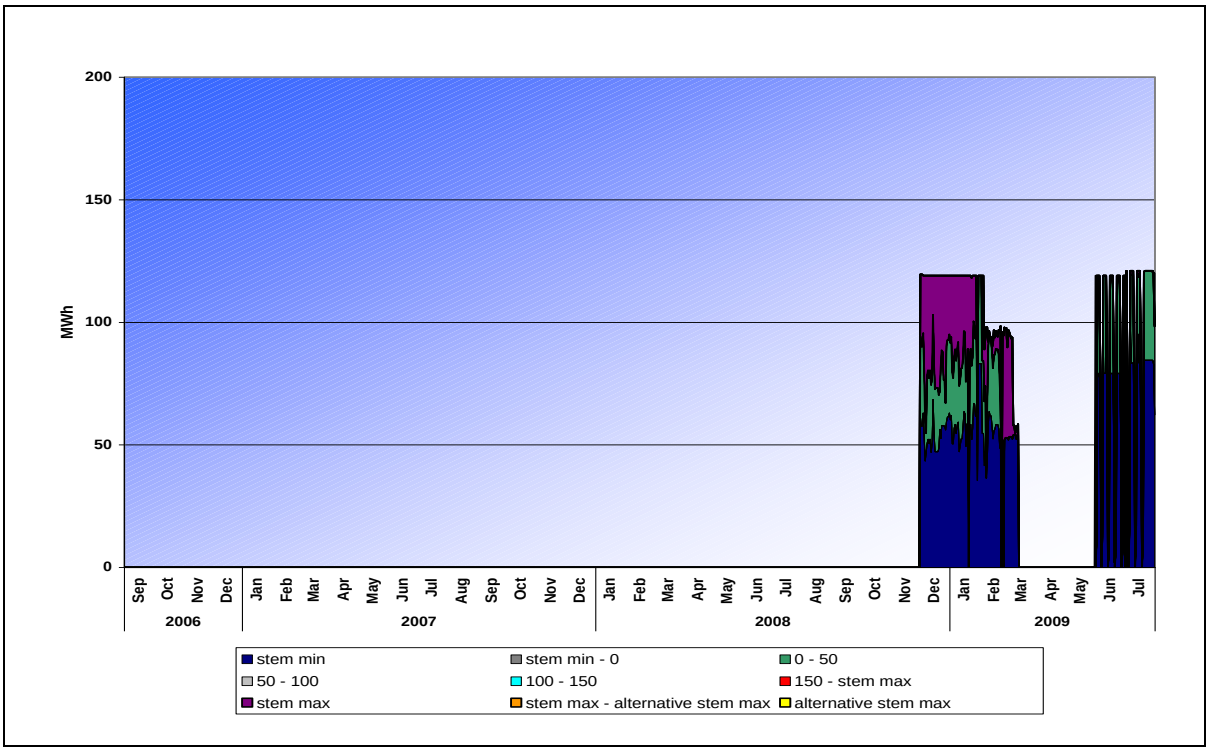


Figure 55: Perth Energy's daily average STEM Bids (cumulative MWh per Trading Interval)

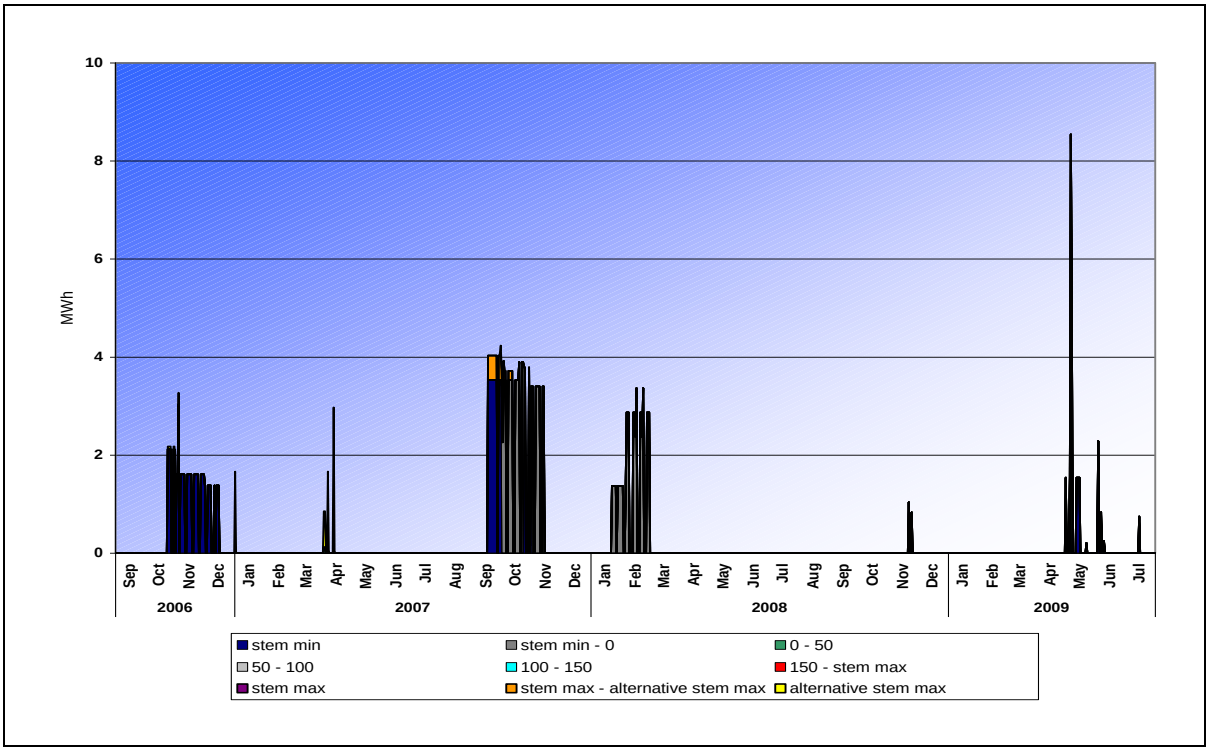


Figure 56: Southern Cross Energy's daily average STEM Bids (cumulative MWh per Trading Interval)

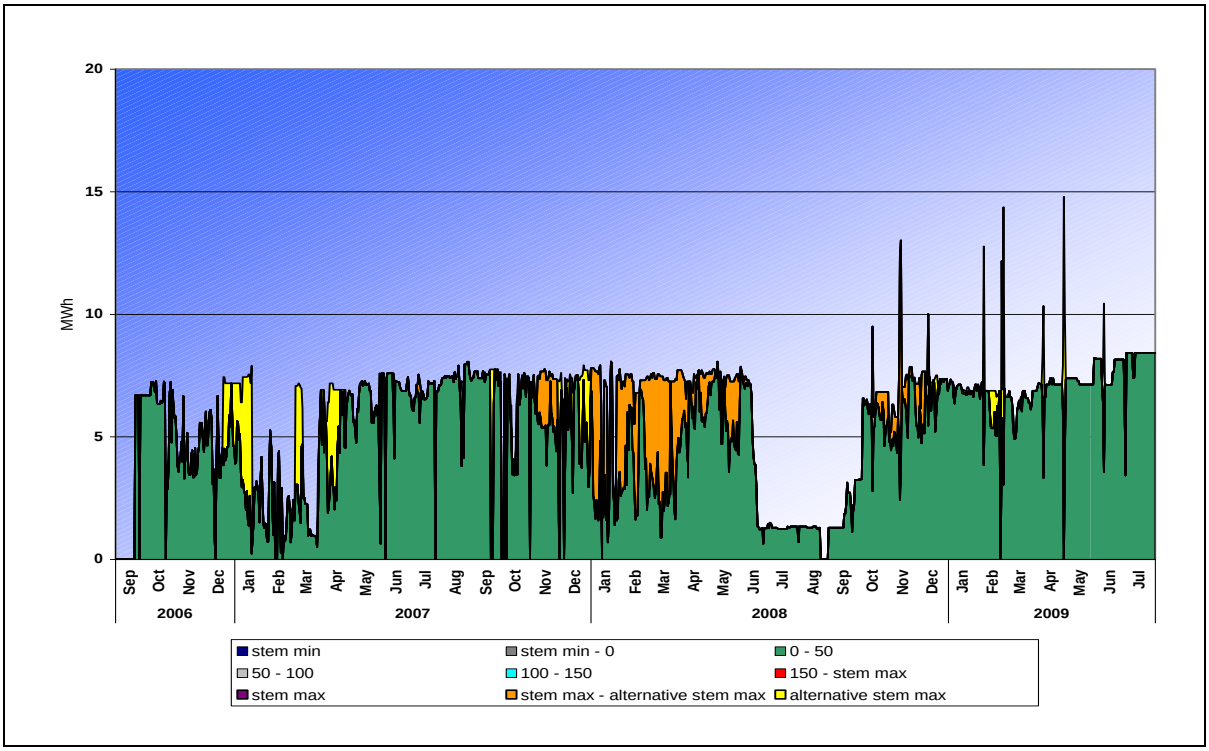


Figure 57: Synergy's daily average STEM Bids (cumulative MWh per Trading Interval)

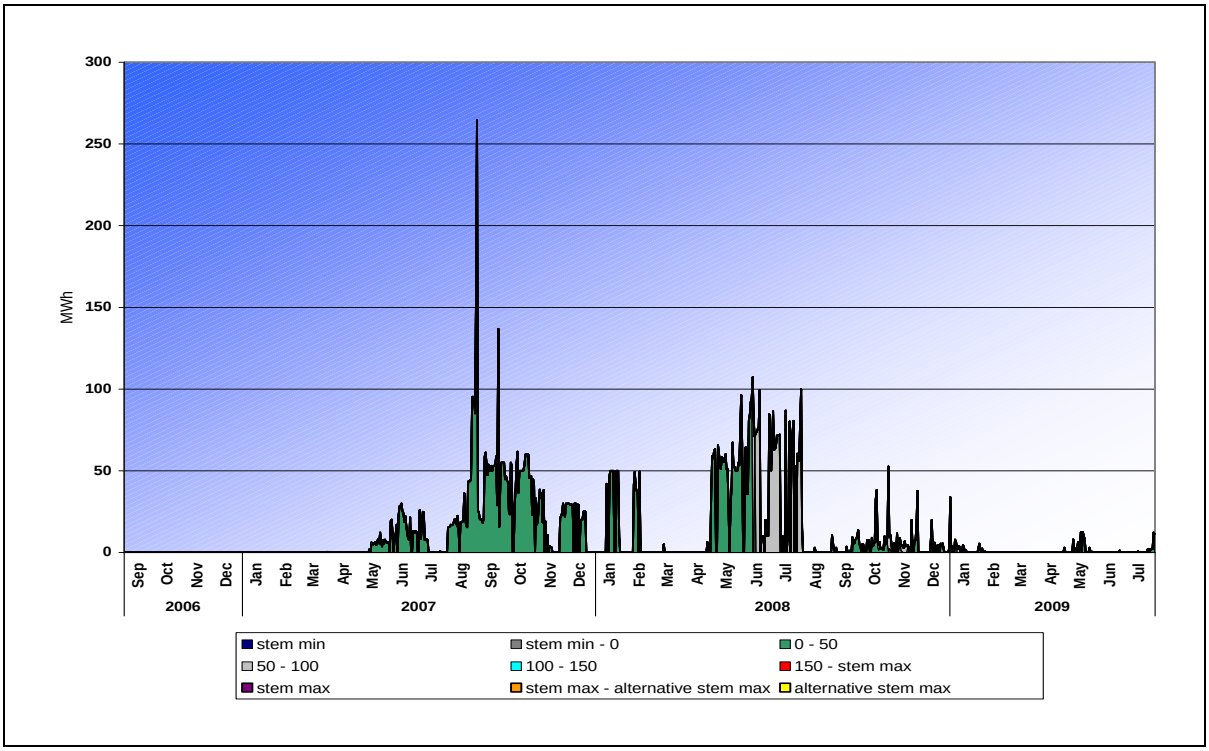


Figure 58: Verve Energy's daily average STEM Bids (cumulative MWh per Trading Interval)