Australian Energy Market Commission

RULE CHANGE

OPTIONS PAPER

National Electricity Amendment (Bidding in good faith) Rule 2014

Rule Proponent

Minister for Mineral Resources and Energy (South Australia)

18 December 2014

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About the AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

Executive summary

This options paper has been prepared by the Australian Energy Market Commission (AEMC or Commission) to facilitate consultation on a rule change request submitted by the South Australian Minister for Mineral Resources and Energy (proponent) proposing changes to the provisions in the National Electricity Rules (NER) that govern the manner in which generators may offer electricity to the wholesale market.

The rules that relate to the generator bidding process are fundamental to the operation of the National Electricity Market (NEM) and the promotion of efficient price outcomes in the interests of consumers, and changes to these rules have the potential to significantly affect participants. As a consequence, the Commission considers that there is value in adding an extra stage of consultation with stakeholders to the normal rule change process prior to the publication of the draft determination.

This options paper

The purpose of this options paper is to discuss the outcomes of analysis undertaken for the Commission, to test stakeholders' views on a number of alternative potential options identified, and to continue the assessment of the proposed rule. This will assist the Commission in determining the best way to address the issues raised by the rule change request and ensure that any changes to the existing frameworks are consistent with, and will contribute to, the promotion of the National Electricity Objective (NEO).

The Commission's assessment of the rule change request to date has required a broad consideration of the issues raised, including those related to the bidding behaviour of generators and the design of the bidding process. The assessment has also involved an investigation of the materiality of the issues and the extent to which they have impacted on market outcomes.

The Commission has identified a number of potential options to address the issues raised, and wishes to test these with stakeholders. While the proponent has proposed a change to the good faith bidding provisions, the fundamental importance of this issue to the functioning of the market has led the Commission to conclude that there would be merit in considering a broader range of options that also have the potential to contribute to the achievement of the NEO.

Defining the issues raised in the rule change request

This options paper firstly seeks to define the problem or market failure that has been identified by the rule change request. In support of this task, the AEMC engaged Professor George Yarrow and Dr Chris Decker from the Regulatory Policy Institute to prepare a report on how efficient prices are achieved in energy-only markets such as the NEM and the impact that the timing of generator offers in the bidding process can have on the ability of the market to achieve an efficient outcome.

Participation in the NEM requires that generators submit bids to the Australian Energy Market Operator (AEMO) specifying the prices they are willing to receive for given

amounts of generation volume offered. Following the submission of initial bids, generators may submit rebids to shift the volumes they are willing to offer between these different price bands.

The ability to rebid provides generators with necessary flexibility to adjust their position to accommodate changes in market conditions and to respond to the offers of other participants. The resulting dynamic process of participants learning and reacting to the actions of their competitors is an important part of an efficient functioning market.

In this way, rebidding drives competitive outcomes that reveal prices reflective of underlying demand and supply conditions, leading to economically efficient operation and investment over the long term.

Potential inefficiencies associated with rebidding

However, the rebidding process can also compromise the ability of the market to arrive at an efficient outcome when rebids are made close to the relevant dispatch interval. This is because participants may still have an incentive to respond but do not have sufficient time to undertake the necessary rebid prior to the relevant dispatch interval occurring.

While there will always be one generator that makes the last rebid for any given dispatch interval, technical limitations on the output of some generators may prevent the learning process from reaching an efficient equilibrium outcome if these generators are unable to provide an efficient physical response.

In the short-term, late rebidding has the potential to result in inefficient price outcomes if high price plant is dispatched ahead of lower price plant that does not have sufficient time to change output to meet its generation targets.

Late rebidding may also reduce the transparency and predictability of spot price outcomes. A lack of transparency in the drivers of spot prices may particularly impact on demand side response if participants are unable to make an economic decision that is based on the potential value of providing a demand response and are therefore less motivated to actively engage in the market.

Late rebids that occur towards the end of trading intervals may mean that retailers and end users end up paying a high 30-minute settlement price without an opportunity to dispatch their own generation or initiate demand response to decrease their exposure. For fast-response generators, this may limit their ability to offer price-reflective hedge products to the market. This may reduce market efficiency by increasing the costs of hedging to market participants which may result in higher pass-through costs to customers.

Additional costs may also arise that relate specifically to the intentions of the rebidding generator and whether the late rebid is a part of a strategy of behaviour that is aimed at misleading competitors and promoting false expectations. A generator's offers could provide market participants with a false expectation of its intentions, which could then

subsequently be exploited through a late rebid that relies on the limited opportunity for other participants to respond.

This form of generator behaviour has the potential to impair the efficacy of the price discovery process by casting doubt on the reliability of information. The consequences of this can be much farther reaching over time than the immediate effects of the harm caused by short-term inefficient price outcomes.

Materiality of the issues identified

In order to assess the materiality of the issues raised, the Commission engaged ROAM Consulting to undertake a quantitative statistical analysis of the nature of rebidding activity in the NEM, including volume, timing, direction and seasonality of rebids for each NEM region. The Commission also engaged Oakley Greenwood to conduct an assessment of the extent to which generator bidding behaviour impacts on the ability of large users in the NEM to engage in demand side participation.

Based on the outcomes of the analysis, the Commission considers that a number of conclusions can be drawn regarding the impacts and materiality of late rebidding by generators in the NEM.

While the NEM has maintained the same broad market design since commencement, the work undertaken by ROAM and Oakley Greenwood suggests that the more widespread occurrence of late rebidding, and rebidding towards the end of trading intervals, has been a recent phenomenon, occurring within the last two years and predominantly in Queensland and to some extent in South Australia.

Although late rebidding quite often has a role to play in responding to price spikes in pre-dispatch forecasts and reducing anticipated market volatility, the recent late bidding behaviour in Queensland and South Australia has resulted in price spikes, specifically towards the end of trading intervals. The Commission also recognises that much of the impact on participants from late rebidding behaviour may in fact occur through the consequential effects on the prices of financial hedge contracts.

The current over-supply of generation capacity has reduced price volatility and created market conditions that are not particularly conducive to the take-up of demand response activities by end-use customers. However, the recent prevalence of late rebidding may have contributed to a further reduction in the amount of demand response that is available by making it difficult to predict or foresee with an acceptable level of accuracy when a period of sufficiently high price to warrant a demand response is likely to occur.

Potential options for consideration

While the Commission notes that the issues raised by the rule change request have not been manifested until recently and only in particular regions of the NEM, the design of the market framework should set reasonable boundaries on the ability of participants to influence price outcomes that are to the detriment of other participants and that are not reflective of an efficient functioning market.

The Commission is consequently considering two broad sets of options that may form the basis of an appropriate regulatory response to these issues. These are:

- the design of a behavioural statement of conduct, similar to the good faith bidding provisions; and
- the design of the market and the bidding process, including potential restrictions on rebidding close to dispatch.

The purpose of a behavioural statement of conduct is to deter generators from engaging in strategies that promote false expectations amongst participants and thereby undermine the efficient functioning of the market process. As such, statements of conduct focus on the intentions of the rebidding generator and act as a guide to appropriate market behaviour. In addition to the proposed rule, the Commission has identified a number of alternative options for changing the design of the good faith provisions.

Placing restrictions on rebidding close to dispatch recognises that inefficient market outcomes may arise regardless of generator intentions. Providing certainty in this way would mitigate the issues of non-responsiveness that result from the current deadline immediately before dispatch by allowing both demand and supply-side participants time to adjust their physical positions.

The determination of appropriate restrictions on rebidding therefore requires a consideration of the trade-off that exists between:

- the promotion of efficient outcomes from the flexibility of the market to respond to changing market conditions; and
- limiting the potentially disproportionate influence on price outcomes from rebids that occur close to dispatch.

The level of restrictions on types of rebids and the window of time over which these restrictions apply are both factors that determine the compromise between these two competing drivers of market efficiency. As such, a complete prohibition on rebidding might be consistent with a relatively short time period of gate closure, whereas a longer notice period might allow for some rebids under specifically defined circumstances. It might also be possible to develop a graduated approach, where restrictions are progressively increased over time.

The Commission considers that these two sets of options are not mutually exclusive and the appropriate solution to the issues raised by the rule change request may involve elements of both. As such, rather than identifying a number of specific options to address the rule change request, this paper sets out the potential changes that may be pursued in relation to these broad policy areas, including implications and reasoning.

In responding to this options paper, stakeholders are encouraged to not only provide their views on the potential changes identified in each of the policy areas discussed but

also consider how changes in each of the policy areas may interact to achieve an overall policy solution. Stakeholders are encouraged to provide any submissions by 12 February 2015. Further details can be found on the AEMC's website.

Contents

1 Introduction

This chapter provides a summary of the rule change request and sets out the Commission's approach to the options paper.

1.1 The rule change request

On 17 December 2013, the South Australian Minister for Mineral Resources and Energy (proponent) submitted a rule change request to the Australian Energy Market Commission (AEMC or Commission) proposing changes to the provisions in the National Electricity Rules (NER) that require generators to bid in good faith.

The NER requires that generators make all bids and rebids in good faith. A bid or rebid will be taken to be made in good faith if, at the time of making the bid, the generator has a genuine intention to honour that bid if the material conditions and circumstances upon which the bid is based remain unchanged. The good faith provisions were proposed by the National Electricity Code Administrator (NECA) and authorised by the Australian Competition and Consumer Commission (ACCC) in 2002 to address aspects of generator's bidding and rebidding strategies that were of concern to jurisdictional ministers and that were seen as manipulating wholesale price outcomes in the National Electricity Market (NEM).[1]

Rationale for the rule change request

This rule change request has been submitted following the Federal Court decision handed down in August 2011 between the Australian Energy Regulator (AER) and Stanwell Corporation (the "Stanwell case"). The proponent is concerned that the Federal Court decision has introduced uncertainty around the operation of the bidding in good faith provisions and highlighted issues in relation to the implementation of the original policy intent.

The proponent considers that the Federal Court's interpretation of the good faith bidding provisions is inconsistent with the original policy intent of the provisions as defined at the time of the ACCC's 2002 determination.

The proponent notes that the ACCC's determination to incorporate the good faith provisions was based on the intention that participants that rely on pre-dispatch forecasts should be provided with some level of assurance that participants intend to honour their bids. Initial bids or rebids that are made without an intention for them to be honoured undermines the reliability of pre-dispatch forecasts and hinders effective and competitive demand and supply side responses.

1 The ACCC was the body responsible for authorising amendments to the National Electricity Code. In 2005, the AEMC was established and assumed responsibility for rule making in the NEM.

The proposed rule

The proponent considers that the proposed rule would resolve the uncertainty that has been introduced through the inconsistency in the interpretation of the provisions. The rule change request proposes to address the concerns by recasting the good faith provisions in the negative such that an inference can more easily be drawn that an earlier bid was not made in good faith if a subsequent rebid is made when there has been no observed change in material conditions or circumstances.

The proponent considers there should be an objectively observable, significant, and quantifiable reason used as the basis for all rebids. The rule change request proposes to include a separate provision to make clear that if a generator makes a rebid on the basis of certain subjective expectations, and those expectations are not met, then this would not be considered to be a change in material circumstances and therefore not a permitted reason for making a further rebid for the same trading interval.

In addition, the proposed rule would require generators to provide complete and accurate information to the AER upon request, and would require that a rebid could only be made in response to a significant and quantifiable change in price, demand or some other data published by AEMO or other material circumstances. Further, if there is a change to any of those material circumstances then those changes would need to be reflected in rebids as soon as practicable.

The proponent considers that these changes to the NER would impose a greater incentive on generators to submit bids promptly that reflect their true intentions at the time of making the bid. This would improve the accuracy and reliability of AEMO forecasts, consistent with the original policy intent of the good faith provisions.

1.2 Purpose of this options paper

In the usual course of events, the Commission would make a draft determination on the proposed rule following an initial round of consultation with stakeholders.[2] However, the Commission considers that, for the purpose of this rule change request, there is value in adding an extra step of consultation to the standard assessment process. The decision to publish an options paper prior to making a draft determination was informed by the following considerations:

1. The issues raised relate to the bidding process which is fundamental to the operation of the NEM and the promotion of efficient price outcomes.

2. The rule change request has elicited a wide variation in views with some stakeholders potentially significantly affected by the proposed changes.

2 On 10 April 2014, the Commission published a notice under section 95 of the National Electricity Law (NEL) setting out its decision to commence the rule change process for this rule change request. The notice was accompanied by a consultation paper that was prepared to facilitate public consultation on the rule change request. The consultation paper is available on the AEMC website.

3. There are a range of potential options available to address the rule change request.

Consultation to date indicates that there is a high level of interest amongst market participants regarding this rule change request.[3] Responses have indicated some uncertainty as to whether the proposed rule is likely to promote the National Electricity Objective (NEO).

As a consequence, the Commission has undertaken further analysis and considered a number of alternative options in addition to the proposed rule. The purpose of this options paper is to discuss the outcomes of this analysis, to test stakeholders' views on the alternative potential options identified, and to continue the assessment of the proposed rule. This will assist the Commission in determining the best way to address the issues raised by the rule change request and ensure that any changes to the existing frameworks are consistent with, and will contribute to, the promotion of the NEO.

Areas of potential policy change

The Commission has considered two principal areas of policy where potential changes may address the issues raised in the rule change request, including:

- the design of a behavioural statement of conduct, similar to the good faith bidding provisions; and
- the design of the market and the bidding process, including potential restrictions on rebidding close to dispatch.

The purpose of a behavioural statement of conduct is to deter generators from engaging in strategies that seek to promote false expectations amongst participants and thereby undermine the efficient functioning of the market process. As such, statements of conduct focus on the intentions of the rebidding generator and act as a guide to appropriate market behaviour. In addition to the proposed rule, the Commission has identified a number of alternative options for changing the design of the good faith provisions.

Placing restrictions on rebidding close to dispatch recognises that inefficient market outcomes may arise regardless of generator intentions. The determination of appropriate restrictions on rebidding requires a consideration of the trade-off that exists between:

- the promotion of efficient outcomes from the flexibility of the market to respond to changing market conditions; and
- limiting the potentially disproportionate influence on price outcomes from rebids that occur close to dispatch.

3 A total of 24 submissions were received in response to the consultation paper. These submissions are available on the AEMC website.

The level of restrictions on types of rebids and the window of time over which these restrictions apply are both factors that determine the compromise between these two competing drivers of market efficiency.

The Commission considers that changes in these policy areas should not be considered as mutually exclusive and the appropriate solution to the issues raised by the rule change request may involve elements of both. As such, rather than identifying a number of specific options to address the rule change request, this options paper sets out the potential changes that may be pursued in relation to these broad policy areas, including implications and reasoning.

In responding to this options paper, stakeholders are encouraged to not only provide their views on the potential changes identified in each of the policy areas discussed but also consider how changes in each of the policy areas may interact to achieve an overall policy solution.

1.3 Remainder of this rule change process

The remainder of the process set out in the NEL involves, at a minimum:

- publication of a draft rule determination;
- at least six weeks of public consultation on the draft rule determination; and
- publication of the final rule determination within six weeks of the close of public consultation on the draft rule determination.

In addition to these steps, the Commission will consider whether there would be benefit in holding a public forum following the close of submissions on this options paper.

Milestone	Timetable
Publication of consultation paper	10 April 2014
Public forum on consultation paper	5 May 2014
Publication of options paper	18 December 2014
Close of submissions	12 February 2015
Draft rule determination	16 April 2015
Final rule determination	9 July 2015

Stakeholders should note that the Commission may make a more preferable rule under section 91A of the National Electricity Law (NEL), where the Commission is satisfied that, having regard to the issues raised by the proposed rule, the more preferable rule will or is likely to better contribute to the promotion of the NEO than the proposed rule.

1.4 Structure of this options paper

The remainder of this options paper is structured as follows:

- chapter 2 sets out the framework for assessing this rule change request;
- chapter 3 discusses the issues raised by this rule change request;
- chapter 4 explores the impacts of generator bidding strategies and assesses the materiality of the issues raised;
- chapter 5 discusses a set of proposed alternative options and provides some commentary on those options; and
- chapter 6 outlines the process for making submissions.

2 Assessment framework

The chapter sets out the Commission's proposed framework for assessing the rule change request.

2.1 NEO assessment

The Commission's assessment of this rule change request must consider whether the proposed rule will or is likely to contribute to the achievement of the National Electricity Objective (NEO) as set out under section 7 of the National Electricity Law (NEL) as follows:

> "The objective of this law is to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to:
>
> a) price, quality, safety, reliability and security of supply of electricity; and
>
> b) the reliability, safety and security of the national electricity system."

Based on its assessment to date, the Commission considers that the relevant aspects of the NEO for further consideration are the efficient investment in and operation of electricity services with respect to the security and reliability of the national electricity system and the price of supply of electricity.

The Commission intends to assess whether the proposed rule would contribute to the promotion of the NEO by:

- increasing the reliability and accuracy of pre-dispatch forecasts, which would provide greater price transparency and operational and investment certainty to market participants. This should lead to efficient price signals for investment and enhance the security and reliability of the electricity system in the long-term interests of consumers of electricity.

- providing for more accurate, reliable and timely information to participants, which should allow for responses which are in line with the underlying conditions of supply and demand. This should lead to efficient wholesale price outcomes and reduce short-term supply costs and peak capacity requirements in the longer-term, thereby lowering the price of electricity to consumers.

2.2 Assessment approach

The rule change request explores potential inefficiencies in market outcomes created through generator rebidding strategies. The request identifies the good faith bidding provisions in the NER as the appropriate means to address these issues, in particular the requirement for generators to bid in accordance with their genuine intentions and

to bid on the basis of significant and quantifiable changes in material circumstances as soon as reasonably practicable.

The practicalities and merits of the proposed rule will be tested as part of the assessment framework and the Commission proposes to consider the issues raised in the rule change request within the broader context of the role that rebidding plays in the NEM.

As noted in the consultation paper, the Commission is basing the assessment framework on four steps as set out below. This options paper addresses the first three of these steps and provides a basis upon which comments from stakeholders can be used to determine, if required, whether there are any potential solutions that would result in net benefits to the market and promote the NEO.

1. *Defining the problem or market failure that has been identified by the rule change request*

   In order to determine the effect of the proposed rule, the first step in the assessment framework has been to define the problem or market failure that has been identified in the rule change request.

   The Commission recognises that an inherent level of price volatility exists in the NEM due to the shape of the supply curve and fluctuating demand, and that this volatility is necessary for generators to recover investment costs and to incentivise new investment.

   However, concerns are raised by the proponent that rebids that are made by generators close to dispatch can provide insufficient time for participants to respond which may reduce the predictability and efficiency of wholesale price outcomes and lead to higher risk management costs for consumers.

   Further, that an inability of participants to respond efficiently to short-term price signals may limit the extent to which price outcomes accurately reflect conditions of supply and demand and underlying cost structures, and that a lack of transparency in price outcomes may hinder long-term investments.

   These concerns raised by the proponent are a useful basis from which the extent of the problem or market failure can be determined. A further discussion of the problems identified by the rule change request is provided in chapter 3.

2. *Assessing the materiality of the problem*

   The next step in the assessment framework has been to test the materiality of the problem. This has involved an assessment of the costs that the issues have created for market participants and how these costs flow through to impact consumers in the long-term.

   Determining the materiality of the problem has comprised both qualitative and quantitative assessments, including statistical analysis. A further discussion of

the impacts and materiality of the problems identified by the rule change request is provided in chapter 4.

3. *Given the materiality, identifying potential solutions to the problem*

   In consideration of the extent and materiality of any problems that are identified, the next step in the assessment framework is to determine potential solutions.

   The development of the potential solutions in this options paper has been undertaken in consideration of the role that rebidding plays in promoting efficient outcomes in the NEM, recognising that rebidding is a necessary function of the market as it provides flexibility for participants to respond to changes in supply, demand and price. This process of price discovery provides efficient operational and investment signals and promotes effective competition.

   While the rule change request proposes a regulation based approach, the Commission has considered alternative approaches based around market design and the bidding process. The options developed to address the issues raised in the rule change request are set out in chapter 5.

4. *Determining whether any potential solutions would result in net benefits to the market and promote the NEO*

   Any potential solutions developed by the Commission will need to result in net benefits to the market and promote the NEO.

   In consideration of the development of potential solutions, the Commission is conscious that, while rebidding strategies have the potential to contribute to inefficient market outcomes, focusing too heavily on short-term rebidding practices might impact on longer run investment incentives in the NEM.

   Rebidding gives rise to price signals for production, consumption and investment that are based on market conditions of supply and demand. The price setting process should be sufficiently transparent such that market participants have certainty that these signals are generally reflective of supply and demand conditions in the NEM. The Commission would be concerned about any solutions that give too much weight to short-term efficiency concerns at the expense of dynamic efficiency by undermining the incentive to innovate and invest over the long-term.

2.3 Research and analysis

The assessment of the rule change request to date has required a broad consideration of the issues raised, including issues related to the bidding behaviour of generators and the design of the bidding process.

The AEMC engaged consultants to undertake a number of pieces of research and analysis in support of the assessment of the rule change request. Consistent with the steps set out in the assessment framework above, the consultant engagements were

commissioned to help establish the nature and materiality of the issues raised, and to identify potential options to address the rule change request.

The consultant engagements included:

- A report on how efficient price discovery is achieved in energy-only markets and the role that price signals play in realising efficient market outcomes, including short term efficiency in dispatch and long term efficiency in investment and the allocation of risk in the market. This piece was prepared by Professor George Yarrow and Dr Chris Decker of the Regulatory Policy Institute.

  The purpose of commissioning this report was to assist with the first step of the assessment framework to define the problem or market failure that has been identified by the rule change request.

- A quantitative statistical analysis of the nature of rebidding activity in the NEM, including volume, timing, direction and seasonality of rebids for each NEM region. The analysis was undertaken by ROAM Consulting.

  The objective of this analysis was to determine the drivers of generator bidding behaviour and to assist with the second step of the assessment framework to assess the materiality and extent of late rebidding.

- An assessment of the extent to which generator bidding behaviour impacts on the ability of large users in the NEM to engage in demand side participation. The objective of the assessment was to understand the extent to which late rebidding impacts on demand side participation. The assessment was undertaken by Oakley Greenwood.

  Similar to the ROAM analysis, the purpose of the work undertaken by Oakley Greenwood was to assist with the second step of the assessment framework to assess the materiality of the problem.

- A survey and comparative assessment of rebidding activity and the rules governing generator rebidding in international markets. The report identifies the key differences and features of the regulatory frameworks and the design of the markets considered and how these impact on the incentives for generators to rebid. The research has been undertaken by the Competition Economists Group (CEG).

  The objective of this analysis was to assist with the third step of the assessment framework to identify options available to address the issues raised by the rule change request.

3 Rebidding in the NEM

This chapter discusses the importance of competition and price signals in supporting efficient investments in the long-term interests of consumers and the role that rebidding plays in the promotion of efficient outcomes in the NEM.

This chapter also discusses the issues raised by the rule change request. Specifically, the impact that the timing of rebids can have on the ability of the market to achieve an efficient outcome. Additional costs are discussed that relate to the intentions of the rebidding generator and whether the timing of a rebid is part of a strategy of behaviour that is aimed at misleading competitors and promoting false expectations.

3.1 The role of rebidding

This section discusses the role that rebidding plays in the promotion of efficient market outcomes and provides background to consider the issues raised by the rule change request.

3.1.1 The role of rebidding in short-term dispatch and long-term investment

An objective of introducing competition to the wholesale electricity sector was to decentralise operational and investment decisions away from central authorities to parties with commercial incentives. In a competitive energy market environment, price signals provide the incentives to guide participants' actions, such as how they should run their plant, when maintenance should be carried out and when and what type of technology to invest in. Profit and capital market disciplines provide incentives to manage risk.

The NEM is designed so that generators earn revenue for the energy they produce and short-term dispatch and long-term investment decisions are driven primarily by wholesale market prices and expectations of those prices.[4] As such, the efficacy of the price signal is critical to the efficient operation of the market.

In a workably competitive market, price signals provide incentives to guide the amount and type of investment in generation capacity.[5] The ability of the spot price to vary in response to changes in supply and demand promotes dynamic efficiency by providing a price signal that encourages the least-cost mix of new entrant generation.

Rebidding provides generators with the necessary flexibility to adjust their position to accommodate changes in the market. Rebidding provides a means for market

4 While a significant amount of generator revenue is determined by hedge contracting arrangements, the price of these hedge contracts is influenced by the expected future spot price.

5 In a workably competitive market it is expected that firms display profit maximising behaviour, seeking the widest possible margin between prices and their underlying costs. Pricing behaviour is disciplined by the threat of new suppliers entering the market in response to price signals and consumers exercising choice.

participants to respond to short-term price signals, which promotes a more competitive outcome contributing to economically efficient production and consumption of, and investment in, the supply of electricity services over the long-term.

Whether a market outcome is efficient or not can depend upon the time period involved. Participants can respond to changes in market conditions or the actions of other participants in the short term through changes in production or consumption and re-pricing or can respond in the long-term through changes in behaviour or physical changes such as changes in the design and operation of plant.

3.1.2 The efficient price discovery process

In the NEM, the settlement price is based on the time-weighted average of the six five-minute dispatch interval prices over the 30-minute trading interval. Generators are required to submit initial price/quantity offers for each 30-minute trading interval in up to ten price bands to AEMO by 12:30pm the day before trading day.[6] Rebids may be submitted up until the start of the relevant five-minute dispatch interval by moving capacity between the nominated price bands, in response to changing market conditions.

Each generator's initial offers submitted to AEMO are combined into a merit order and used to forecast the dispatch outcomes for the following day's trade. Initial bids that are based on a generator's genuine expectations of market conditions provide the best estimate that other participants can rely on to make their own commercial and availability decisions. As such, initial bids that are meaningful and broadly reflect the generator's market intentions can increase the predictability and efficiency of market outcomes.

As time progresses from the initial bids, rebidding provides the necessary flexibility to achieve an economically efficient dispatch arrangement of generation in the short-term. For instance, a coal-fired generator may rebid capacity into lower price bands to maintain a minimum level of output in response to falling demand. This ensures that, to the extent possible, the wholesale price of electricity reflects the balance of supply and demand at dispatch.

Rebidding may also be used by generators to manage an unplanned outage. If a unit trips and is offline, the generator may rebid its remaining capacity into lower price bands to ensure that it is able to cover any contractual obligations, and thereby manage market risks.

Further, moving capacity into lower price bands provides the generator with an opportunity to dispatch greater output from existing generation units. Without this ability, there is the likelihood that demand will be met from higher priced generators.

6 Scheduled loads can also submit bids to AEMO and can make rebids. However, this paper focuses on issues raised in the rule change request, which relate to the behaviour of generators engaging in rebidding.

In this fashion, rebidding can promote more efficient price outcomes, given the market and network conditions.

Rebidding facilitates the iterative process of price discovery as generators are provided with the necessary flexibility to adjust their position to accommodate changes in the market.

The discovery of economic costs

As noted in section 2.3, Professor George Yarrow and Dr Chris Decker from the Regulatory Policy Institute were engaged by the AEMC to provide a report on how efficient price discovery is achieved in energy-only markets and the role that price signals play in realising efficient market outcomes.

Yarrow notes that for short-term efficiency in energy-only markets to be achieved, prices must reflect marginal economic costs, not marginal incurred costs.[7] Incurred costs encompass the actual expenditure made or directly incurred in that period as a result of increased output, such as fuel costs. Economic costs include fuel costs but also encompass economic rents. Short-term economic rents compensate generators for fixed costs and costs attributable to start-up, shut-down and changes in output, which require remuneration.

For a price to be efficient in any particular market period, it must provide economic rents to the marginal generator and therefore must be in excess of incurred costs. Generators have an incentive to bid to a price that is higher than their incurred costs but below the offers of their competitors. In this manner, generators aim to be dispatched in preference to their competitors and at the same time receive a price for their output which is in excess of their incurred costs and provides economic rents. The ability of the generator to acquire economic rents may be increased if they bid at a price that is higher than the incurred costs of their competitor, knowing that the competitor will attempt to also acquire economic rents by bidding at a price above its own incurred costs.

For an electricity market design such as the NEM with a uniform clearing price, the competitive bidding process tends to lead towards a least cost generating mix for any given level of required output.[8] Yarrow notes, however, that this is a tendency rather than a strict rule. A generator may incorrectly estimate the economic rents that are available in a given pricing period and as such may bid higher than a competitor despite the fact that the bidding generator's costs are actually lower.

However, such overshoots in estimation are part of the process of efficient price discovery. Generators can be expected to have good information about their own costs, but pricing strategies based around recovery of those and other costs that are not directly related to the level of output in a particular period will depend upon them taking a view on the state of demand for their output in a sequence of pricing and

7 Professor George Yarrow and Dr Chris Decker (Regulatory Policy Institute), *Bidding in energy-only wholesale electricity markets*, December 2014, p. 4.

8 Ibid, p. 7.

dispatch periods. The demand for their output not only depends on system demand in the relevant pricing period but also on the bid functions of other generators.

This suggests therefore that efficient price discovery has more to do with the discovery of efficient levels of economic rents than with achieving efficient dispatch in the very short term.[9] The information required to determine economic costs is not available ex-ante and, as such, efficient economic costs are revealed through the process of price discovery. Economic costs and prices are jointly and simultaneously discovered via the competitive process.

Generator expectations

Yarrow notes that competitive bidding processes are characterised by a continual updating of information. New information will be used by participants to update expectations about competitors' costs and competitors' expectations, including competitors' expectations of other competitors' expectations and so on.[10]

For example, the occurrence of a market event could be characterised as a change in market information that will impact on generators' expectations as well as their expectations of other generators' expectations.[11] The occurrence of this market event will see an adjustment to a new 'calculated equilibrium' based on the standing offers of market participants. However, the standing offers will not reflect any updated information about the market event that has occurred. As such, the 'calculated equilibrium' will tend to be inefficient as it is based on outdated information. As a consequence, the period following a market event is typically characterised by an iterative process of adjustment where the expectations of all market participants shift and they attempt to influence the market price.

Yarrow makes the important point that it is not the change in market conditions that triggers generators to adjust their position but rather the change in their expectations. While a change in the environment that is readily observable and objective may trigger a change in expectations, it could also occur in the absence of such a change. This is analogous to market activity that occurs following the decision of the Reserve Bank of Australia to not change interest rates. If market participants had generally expected a change to interest rates to occur, then it follows that participants would adjust their position in the market to reflect the fact that there was no change. In practice, a generator's offers will reflect its subjective expectations of any number of events occurring or not occurring.

While participants will generally have a good idea about the implications of the occurrence or non-occurrence of a given event on their relative position and costs, they are less likely to know the implications for other market participants and how they will react. As such, there is a process of learning that is typically undertaken following the

9 Ibid, p. 8.

10 Ibid, p. 9.

11 In this instance, a market event is defined as the occurrence of anything that has the potential to influence the market expectations of participants.

occurrence or non-occurrence of a market event. The process may be quite short if participants are responding to a familiar event but could be substantially more protracted if the implications of the event are more complex.

Whether a market outcome is efficient or not can depend upon the time period involved. Productive and allocative efficiency are usually assessed on the basis of a given state of economic knowledge or information, whereas dynamic efficiency is concerned with the expansion of this state of knowledge or information over time.[12]

Yarrow suggests that investment decisions are influenced by expectations of prices over rather longer periods than decisions about levels of generation but that the rules of the price determination process are important.[13] A systematic bias towards the determination of prices that are lower than short-term efficient levels will tend towards inefficiently low levels of investment in generating plant. Similarly, a price determination process that leads to higher than efficient levels of economic rents will tend to lead to over-investment in generating plant.

The design of the NEM trading arrangements

The NEM is constructed as a series of repeated auctions that determine the price of electricity for each 5-minute period of the day. Generators may place bids in the auction up to the time of dispatch, with the only limitation on timing being a practical one of a few minutes required by AEMO's dispatch systems to incorporate the rebid into the determination of the price for the 5-minute period.

Generally, generation is dispatched to meet demand with the highest clearing bid price setting the five-minute dispatch price. The price that generators receive for energy produced, and on which the market is settled, is calculated as the time-weighted average of the six five-minute dispatch prices over the 30-minute trading interval.

This mismatch in the pricing of dispatch and settlement can influence the bidding behaviour of generators and impact the efficient price discovery process. The five-minute dispatch prices may not always reflect an efficient outcome when generators are remunerated on the basis of the 30-minute settlement price. This is discussed further in the next section.

3.2 Issues with rebidding

This section discusses the issues associated with rebidding in the NEM and provides a broader context to consider the issues raised in the rule change request.

12 Professor George Yarrow and Dr Chris Decker (Regulatory Policy Institute), *Bidding in energy-only wholesale electricity markets*, December 2014, p. 6.

13 Ibid, p. 10.

3.2.1 Late rebidding

Energy-only markets for electricity can be distinguished from other commodity markets by the requirement that supply and demand must be matched continuously. The instantaneous delivery of electricity creates a deadline by which a price for both production and consumption must be determined.

As discussed, a generator's market offers for any given 5-minute period do not reflect an expectation of one particular path or series of events. The price and volume combinations that generators offer to the market are based on a subjective expectation of the probability of any number of events occurring or not occurring. Each one of these events may have specific implications for the generator's expectations of its market position relative to its competitors.

Generally, as time moves towards the point of dispatch, the level of information increases upon which the generator can assess the probability of any particular event. Information available to the generator increases over time and becomes a maximum at the point of dispatch, where by definition, the occurrence or non-occurrence of any given event becomes a certainty. As a consequence, a generator has an incentive to wait until the last possible moment to make a rebid because that is when the most amount of information is likely to be available upon which it can make a decision on its final market position.

Late rebidding and efficient price discovery

Yarrow notes that, while waiting until the last moment to make a rebid is essentially a cost free strategy for the rebidding generator, it can lead to the creation of certain externalities in the market. Rebids made very close to dispatch are likely to be less valuable to the process of efficient price discovery because they leave less time for the iterative process to play out. Ultimately, the deadlines created by the repeated auction process means that, for any given 5-minute period, there will always be a final rebid made by a single generator.

The ability of the market to arrive at an efficient outcome may be compromised by rebids that are made close to the relevant dispatch interval. Late rebidding may prevent an efficient outcome as participants may still have an incentive to respond but do not have sufficient time to undertake the necessary rebid prior to the relevant dispatch interval occurring.

Generally speaking, the efficiency of price outcomes is likely to be enhanced in circumstances where market participants are least constrained in their ability to respond to the actions of other participants. Trading arrangements that provide participants with the opportunity to frequently and incrementally adjust their position in response to the changing market position of other participants are more likely to lead to an efficient price outcome.

Yarrow notes that, while a late rebid may lead to an inefficient price outcome, the efficient price is not necessarily the price that would have prevailed in the absence of

the late rebid.[14] The efficient price may in fact be significantly higher than what would have been set by the market operator but for the rebid. This is further complicated by the fact that the market is never fully efficient and overshoots and undershoots are a normal feature of the iterative discovery process.

Responding to a late rebid

Yarrow notes that not all participant responses that are prevented by late rebids are the same. Rebids can trigger responses by other participants which can be classified as one of two forms.

- Price response - A generator may respond to a competitor's rebid by re-offering its current generation output at a different price through its own rebid. This form of response shifts output that is already being generated into a different price band. A price response does not involve any adjustment in production, and as such, would generally only be prevented if a late rebid was made within a few minutes of the relevant dispatch interval.

- Physical response - A generator may respond to a competitor's rebid by changing production to meet its existing offers. Adjustments in production involve time lags and a generator's ability to meet its market offers may be inhibited if a late rebid by a competitor occurs within the time period in which ramp rates impose constraints on changes in generation output. This form of response is not isolated to generators and can equally affect participants on the demand side that wish to adjust their electricity consumption to manage purchasing costs.

As such, price reactions by competitors can be very quick, down to a period of a few minutes, while physical or production responses may take longer, particularly if it involves calling on plant with slower response times.[15] The inefficiencies created by late rebidding can therefore be expected to be higher in the latter circumstance. Production adjustments may involve time lags and costs, and costs tend to be higher the shorter the time period over which adjustments have to be made.[16]

As discussed in section 3.1.2, an efficient functioning market need not provide an efficient price outcome in each and every dispatch interval. The iterative process of price discovery involves a dynamic process of participants learning and reacting to their competitors' actions. As such, overshoots and undershoots should be expected but over time the market should trend towards a longer-term equilibrium. However, technical limitations on the output of generators may prevent this learning process from reaching an efficient equilibrium outcome if generators are unable to provide an efficient physical response.

Generators require time to adjust their output to meet their offers in the bid stack. The amount of time required depends upon a number of factors, including start up times

14 Ibid, p. 14.

15 Ibid, pp. 18-19.

16 Ibid, p. 15.

and rates of change of output. In a hypothetical market environment where generators could seamlessly and instantaneously meet their production targets, the impacts of late rebidding would be significantly reduced. There would be little distinct advantage to any particular generator from engaging in a late rebid. A late rebid made by a generator that shifted volume from a low price band to a high price band close to dispatch would most likely see another generator instantaneously increase output to meet their offers in the bid stack thereby undercutting the offers of the late rebidding generator. It is the inability of certain generators to physically respond in time that drives most of the impacts of late rebidding.

The incentives to engage in late rebidding are further exacerbated by the design of the NEM bidding process and trading arrangements. As discussed in section 3.1, there is a mismatch between dispatch and settlement such that dispatch prices are calculated every five minutes while the market is settled in the basis of the time-weighted average of the six five-minute dispatch prices over the 30-minute trading interval.

This mismatch in the pricing of dispatch and settlement can influence the bidding behaviour of generators. A generator may attempt to spike the price of the last or second last dispatch interval of a trading interval in order to increase the 30-minute average price. Generators will generally achieve this by rebidding generation volume into higher price bands and are likely to be successful if they undertake the rebid close to the relevant dispatch interval in order that other market participants have insufficient time to initiate a supply or demand-side response.

3.2.2 Market inefficiencies caused by late rebidding

The discussion of inefficiencies caused by late rebidding in the NEM has a long history. In 2001, NECA considered the effect of generator bidding strategies on market prices and noted:[17]

"Those very short-term price spikes have no basis in the underlying dynamics of the market. They do not represent a genuine price signal to either the supply side, in terms of the need for new investment, or the demand side of the market. Moreover, because by their very nature they arise so suddenly and are so very short-term, no sort of competitive response is possible. Taken together, however, they have a significant effect on prices. They also add significantly and disproportionately to trading risks."

In the short-term, late rebidding has the potential to result in inefficient price outcomes if high price plant is dispatched ahead of lower price plant that does not have sufficient time to change output to meet its generation targets. In many instances, technical limitations of fast-start generators may mean that they are unable to be dispatched at short notice and if they are dispatched may have minimum operating times which may require them to keep generating for some time after the event.

Late rebidding may also reduce the transparency and predictability of spot price outcomes. Time constraints that limit the ability of market participants to respond to

17 NECA, *Generators' bidding and rebidding strategies and their effect on prices - report*, July 2001, p. 5.

the actions of others may mean that a competitive supply or demand side response cannot be assumed, thereby making it difficult for market participants to forecast spot prices, further reducing the efficiency of market outcomes. This may increase the costs of hedging required to manage price risk and may result in higher prices for consumers.

A lack of transparency in the drivers of spot prices may particularly impact on demand side response if participants are unable to make an economic decision that is based on the potential value of providing a demand response and are therefore less motivated to actively engage in the market.

Late rebids that occur towards the end of trading intervals may mean that retailers and end users end up paying a high 30-minute settlement price without an opportunity to dispatch their own generation or initiate demand response to decrease their exposure. For fast-response generators, this may limit their ability to offer price-reflective hedge products to the market. This may reduce market efficiency by increasing the costs of hedging to market participants which may result in higher pass-through costs to customers.

Further, fast-response generators may seek to adjust operating regimes or invest in improvements to plant flexibility in order to more promptly respond to price spikes caused by late rebids. However, the fact that late rebids may result in inefficient market price outcomes suggests that any such additional expenditure by fast-response generators to respond to these prices may not represent an efficient investment.

Over the long-term, the purpose of the market as a mechanism to encourage efficient investment may be undermined. Dynamic efficiency may be compromised if distorted price signals encourage new entrant generation of a type that is not optimal. Yarrow notes that, over the long-term, less fast-response capacity may become available to the system, which would in turn tend to increase the payoffs from very late rebidding and to increase the frequency with which it occurred.[18]

3.2.3 Generator intentions

As discussed in section 3.1.2, there are benefits from generators submitting initial bids that are meaningful and broadly reflect the generator's market intentions. Meaningful initial bids provide credible information to other participants upon which commercial and availability decisions can be made.

However, Yarrow notes that the 'firmness' of initial bids can be diminished by the fact that market participants are allowed to make subsequent changes to their offers prior to dispatch.[19] Offers can be lowered in the event that initial bids are undercut by competitors. This suggests that restricting the level of rebidding that is permitted

18 Professor George Yarrow and Dr Chris Decker (Regulatory Policy Institute), *Bidding in energy-only wholesale electricity markets*, December 2014, p. 15.

19 Ibid, p. 16.

between the initial bid and dispatch would create an incentive for participants to submit more meaningful initial bids.

There is therefore a trade-off that exists between restricting rebidding to encourage generators to submit meaningful initial bids on the one hand and permitting rebids to facilitate the process of price discovery to achieve efficient market outcomes on the other.

Inefficiencies related to the intentions of the late rebidding generator

The incentives that unrestricted rebidding can have on the provision of less meaningful initial bids can also provide opportunities for generators to mislead other participants.[20] This could arise from actions that, through the initial bid, influence the expectations of other participants. An initial bid could provide market participants with a false expectation of the generator's intentions, which could then subsequently be exploited through a late rebid that relies on the limited opportunity for competitors to respond. Bidding behaviour which misleads other participants need not only arise through a generator's initial bids but could be applied to any circumstance where a generator's existing offers to the market do not reflect their intentions at dispatch.

Technical limitations may prevent certain generators and demand side participants from enacting a production response with limited time available. The potential for financial gain to the generator may have been reduced had it signalled its intentions much earlier through a rebid.

Inefficiencies then arise from the degradation in the reliability of information that is made available to market participants. This form of generator behaviour has the potential to impair the efficacy of the price discovery process by casting doubt on the reliability of information.[21] The consequences of this can be much farther reaching over time than the immediate effects of the harm caused by the sudden increase in price.

Therefore, while late rebids may have the same price impacts irrespective of the generator's intentions, the costs to the market might be very different. These additional costs relate specifically to the intentions of the rebidding generator and whether the late rebid is a part of a strategy of behaviour that is aimed at misleading competitors and promoting false expectations.

Yarrow makes the point that the diffuse and long term nature of the harmful effects of such misleading conduct mean that they are not readily susceptible to economic evaluations such as those used to assess evidence of market power. Policy that focuses on market manipulation must instead focus on the conduct itself and the motivations and intentions that lie behind it. Typically, such policy consists of statements of appropriate market conduct in rules and regulations. In the NEM, this role has traditionally been served through the good faith bidding provisions.

20 Ibid, pp. 16-17.

21 Ibid, p. 23.

4 The impacts and materiality of generator bidding strategies

The purpose of this chapter is to provide an assessment of the materiality in the NEM of the issues that have been raised drawing on the results of the analysis undertaken by ROAM Consulting and Oakley Greenwood.

4.1 Late rebidding and the effect on market outcomes

The AEMC engaged ROAM Consulting to undertake a quantitative analysis of rebidding activity in the NEM. The objective of the analysis was to provide an assessment of the materiality of the issues that are raised in the rule change request by investigating the extent to which generator bidding, and more specifically late rebidding, has impacted on pool price outcomes in the NEM.

4.1.1 Key findings

ROAM found through its analysis that:

- the overall rebidding activity of generators has progressively decreased each year since 2007 with a relatively minor resurgence in rebidding activity in the last two years;
- there is little evidence since 2007 of a systematic tendency across the NEM of generators rebidding towards the end of trading intervals and rebidding just prior to dispatch, with the exception of more recently in Queensland, and to a lesser extent in South Australia;
- there is evidence that, when late rebidding has occurred in Queensland and South Australia, it has generally been to shift capacity into price bands above $300/MWh, although it was noted that late rebidding quite often has a role to play in responding to price spikes in pre-dispatch forecasts and reducing anticipated market volatility;
- higher demand and low import headroom tend to be significantly related to an increased likelihood that rebids will represent movements of capacity to bid bands below $300/MWh, except for in Queensland, where it is the opposite, with higher demand generally resulting in an increased likelihood of capacity being moved to bid bands higher than $300/MWh;
- there is a strong statistically significant relationship between the probability of pool price spikes and the occurrence of late rebidding in Queensland in 2014, and to a lesser extent in South Australia in 2013; and
- there is a trend in Queensland during 2013 and 2014 of generation withholding capacity to high price bands towards the end of trading intervals.

4.1.2 Methodology

The work was divided into two stages comprising a descriptive statistical analysis of rebidding in the NEM and an identification of statistically significant relationships between generator bidding behaviour and market parameters such as spot prices and demand.

The analysis covered the period between 1 January 2007 and 1 August 2014. This period was chosen so as to be long enough to capture the period prior to the recent decline in demand and relative growth in supply.

In stage 1, ROAM processed all of the bidding data submitted by generators since the beginning of 2007 to develop descriptive statistics which illustrated:

- the frequency of rebidding by each generating unit on a yearly, monthly and time of day basis;
- the frequency with which rebids were submitted that represented a movement of capacity to higher or lower price bands;
- the timing of rebids with respect to the 5-minute dispatch intervals to which the bid applied; and
- the frequency with which rebids were submitted for dispatch intervals within the same 30-minute trading interval.

In stage 2, the data collected in stage 1 was used to examine the potential for statistically significant relationships between observations as to the nature of rebidding and other factors such as regional demand, spot prices, etc.

A more detailed explanation of the methodology adopted by ROAM is provided in appendix B.

4.1.3 Results from the analysis

The following section sets out the principal findings from ROAM's analysis on the extent and impact of rebidding, including late rebidding, in the different regions of the NEM.

For stage 1, ROAM's analysis was based on a large dataset (300 million separate data points) of generator rebidding since 2007 and produced an extensive collection of results.

For the purposes of the stage 2 analysis, ROAM developed a series of tables to demonstrate the statistical relationships between generator bidding behaviour and relevant market variables, including price, demand, pre-dispatch forecasts, etc. The results of the analysis are based on the symbols and colours set out in table 4.1.

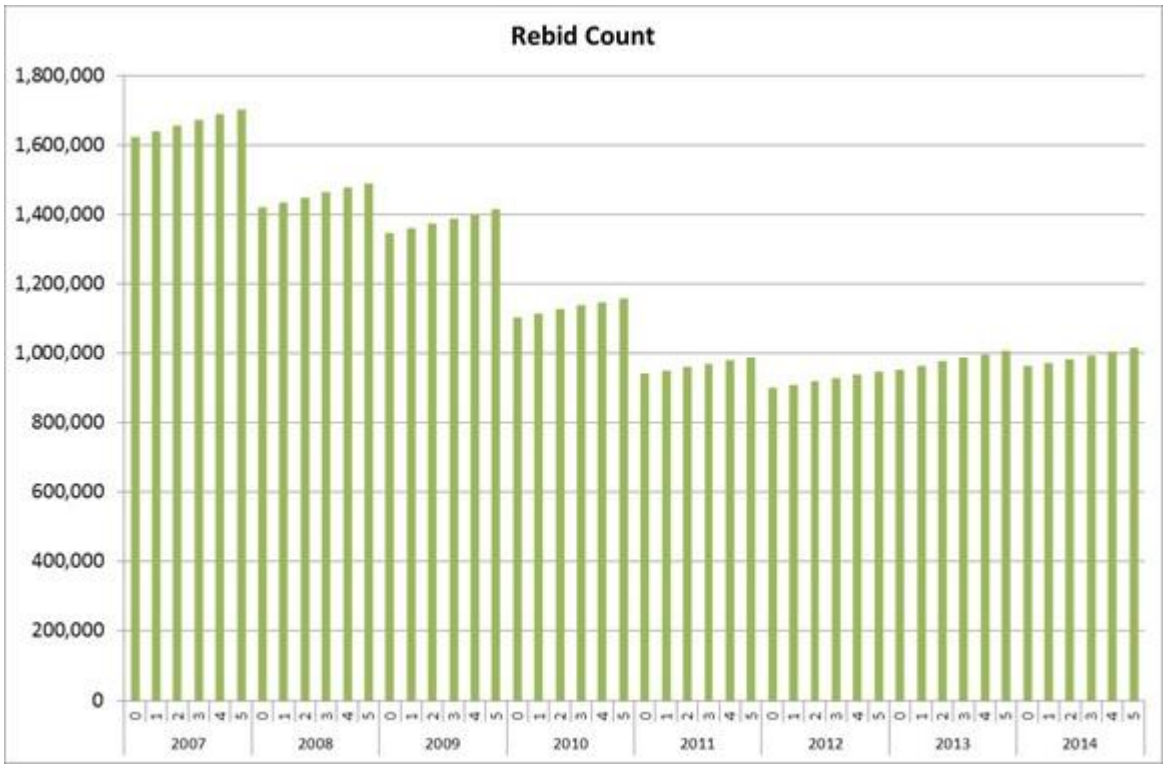
Table 4.1 Illustrations of statistical significance

Inference	Symbol	Direction	Significance Level
Mildly Significant		Positive	10%
Moderately Significant		Positive	5%
Highly Significant		Positive	1%
Mildly Significant		Negative	10%
Moderately Significant		Negative	5%
Highly Significant		Negative	1%

Late rebidding

Figure 4.1 below shows the count of all rebids that have occurred in the NEM since 2007, categorised according to which number dispatch interval within the trading interval that they apply to. It can be seen that rebidding activity has been decreasing year on year, with a mild resurgence in the two most recent calendar years.[22] It is important to note that the chart does not show a count of the number of rebids that have been *made within* each dispatch interval, but rather the number of rebids which may have been made some time before but which *apply* to each dispatch interval.

Figure 4.1 Count of all rebids that apply to dispatch intervals - NEM



It is evident from the chart that, within each year, the number of rebids that apply to each dispatch interval increases over the trading interval. This is to be expected, as rebids are made for whole trading intervals rather than for specific dispatch intervals, and so any rebids that are made within the relevant trading interval to which they

22 Note that 2014 has been annualised based on data obtained up to the start of August.

apply will only impact the remaining dispatch intervals within that trading interval. Later dispatch intervals within trading intervals will therefore accrue more rebids that apply to them over time than earlier dispatch intervals.

An important point to note from figure 4.1 is that the gradient of the increase across dispatch intervals within each year is relatively linear, which suggests that in the NEM as a whole, there is minimal evidence of a systematic tendency towards actively rebidding towards the end of a trading interval. Evidence of rebidding towards the end of trading intervals would tend to show a curved rather than linear relationship.

However, figure 4.2 demonstrates how this relationship changes when analysing rebidding behaviour at a regional level. The chart shows a comparison of the tendency for rebids to occur close to dispatch (late rebidding) where volume was shifted to price bands above $300/MWh. For the purposes of comparison, the volume of rebids has been averaged across all dispatch intervals and across all generating units within each region.[23] It is evident that there is a significantly greater tendency to rebid close to dispatch in Queensland than in any other region of the NEM. This is particularly evident in the two most recent calendar years during the summer months.

Figure 4.2 Regional comparison of late rebidding that shifted volume to price bands above $300/MWh

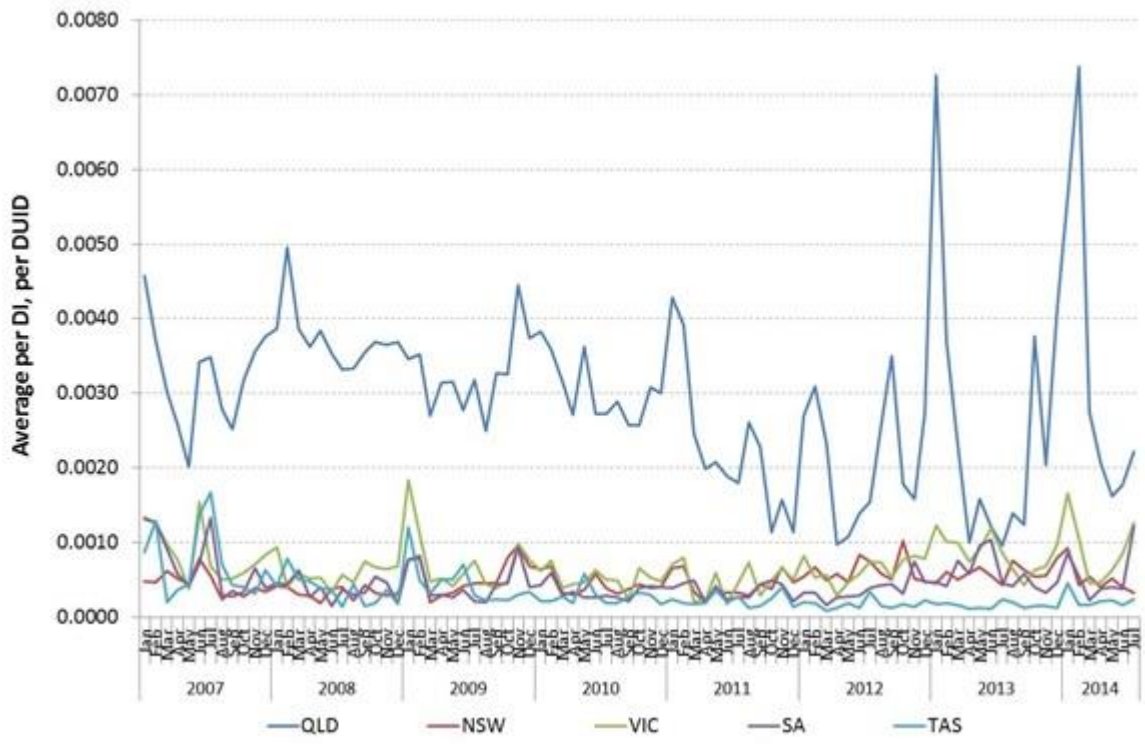
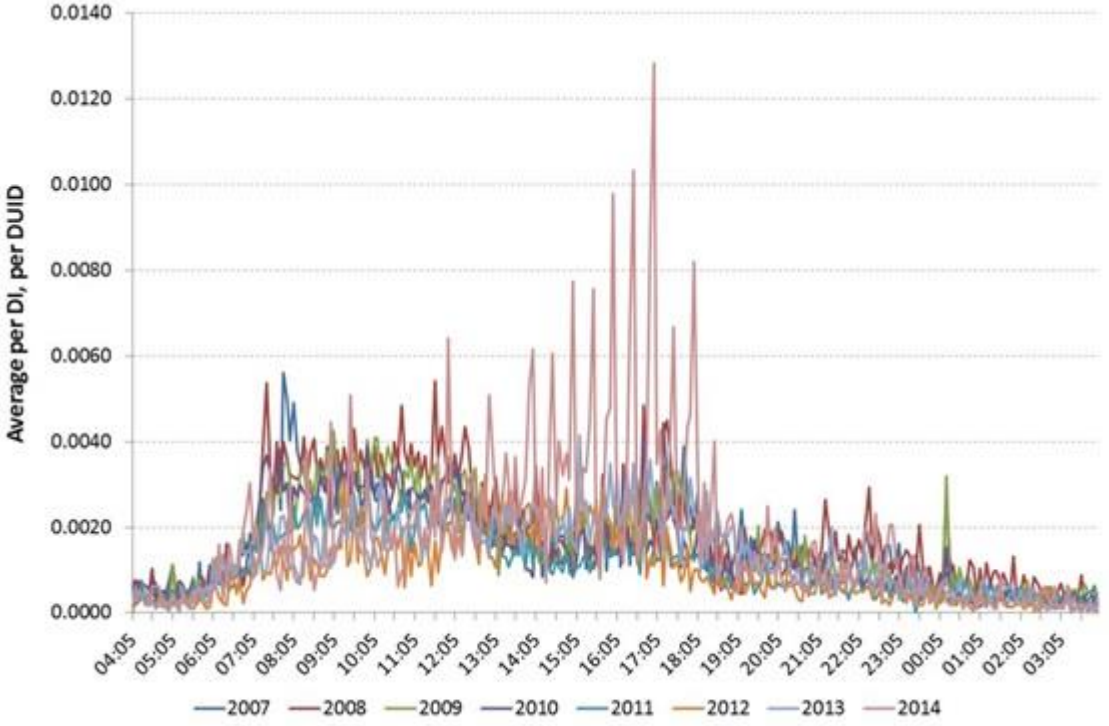


Figure 4.3 breaks the observations in Queensland down by time of day. It can be seen that most of the late rebidding to price bands above $300/MWh has occurred towards the afternoon and early evening when demand is at its highest. Specifically, it can be

23 Care should be taken in comparing results as the number of generating units varies between regions.

seen that the most recent calendar year has seen late rebidding by generators that is significantly greater than activity in previous years.[24]

Figure 4.3 Time of day late rebidding to price bands above $300/MWh - QLD

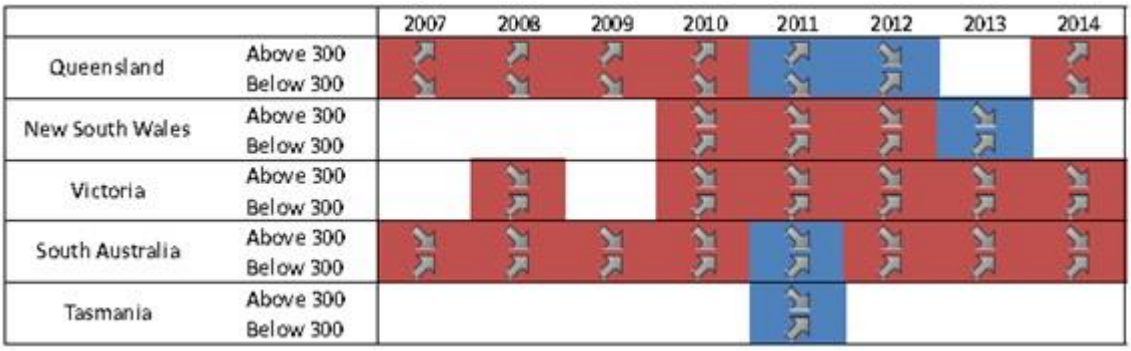


The relationship between late rebidding and market conditions

Table 4.2 shows the relationship between the level of demand and the occurrence of late rebidding into low and high price bands. While not all years show a significant relationship, in those that do, higher demand tends to be significantly related to an increased likelihood that all rebids will represent movements of capacity to bid bands below $300/MWh (convergent arrows). In Queensland, it is generally the opposite with higher demand resulting in an increased likelihood of capacity being withdrawn to bid bands above $300/MWh (divergent arrows).

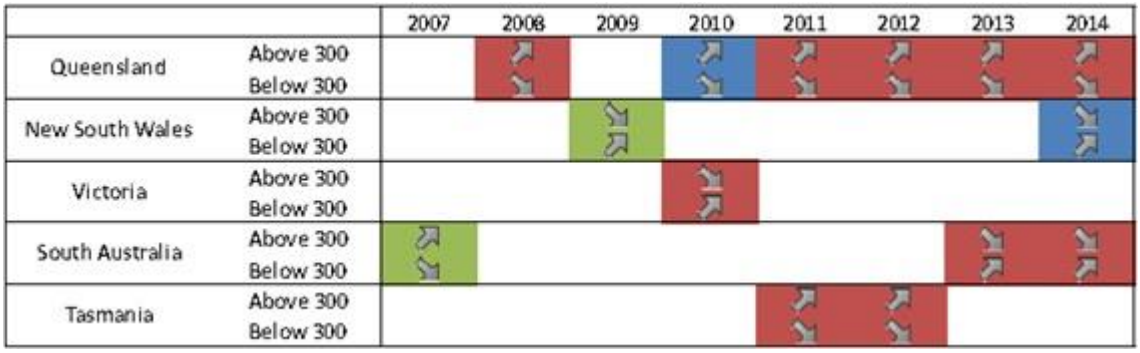
24 Once again, it should be noted that the results for 2014 have been annualised based on data recorded up to the start of August. As such, the January and February period is given greater weight for 2014.

Table 4.2 Relationship between demand and late rebidding



ROAM also considered the impact of import headroom on bidding behaviour. Import headroom refers to the spare capacity for interconnectors to import energy and is commonly a factor in high regional prices. In the analysis, headroom considers the combined import across multiple interconnectors. Low import headroom was expressed as being below 150 MW. Table 4.3 shows that Queensland has the most significant relationship between low import headroom and the type of late rebidding. Low import headroom consistently results in an increased frequency of late rebids which move capacity above $300/MWh.

Table 4.3 Relationship between low import headroom and late rebidding above $300/MWh



ROAM considered two case studies to examine the impact of binding transmission constraints on bidding behaviour. The two constraints were:

- Q>>NIL_855_871 in Queensland
- N>>N-NIL_S in New South Wales

ROAM identified these two constraints as having had significant impacts on wholesale market price outcomes in the past, although it was noted that both of these constraints have since been alleviated through network investment.

Table 4.4 shows the relationship between late rebidding frequency in Queensland and New South Wales and the binding of transmission constraints. The grey sections of the table represent periods when the constraints did not bind. There is a positive relationship between late rebidding frequency and the binding of constraints in

Queensland in 2012 and 2013 and in New South Wales in 2009 and 2010. ROAM suggests that the negative relationship in Queensland from 2008 to 2011 is the result of accounting for other factors such as demand and import headroom, which both tend to be related to the incidence of constraints binding, ie demand is generally high during periods when the constraints are binding.

Table 4.4 Binding constraints and late rebidding frequency

Table 4.5 shows an increased likelihood in Queensland in 2011 and 2013 of late rebidding into high price bands when transmission constraints are binding.

Table 4.5 Binding constraints and late rebidding type

Price impacts

Table 4.6 shows the impact of high pool price forecast 30 minutes before a dispatch interval on the type of rebids submitted for that dispatch interval during the 30 minute period. South Australia is the most extreme example, with high pre-dispatch forecasts resulting in increased bidding activity to low bands in all years. This is also generally true for Queensland and Victoria in recent years. This indicates an efficient response to the market signal that the region is short of low priced capacity in the near future.

Table 4.6 Relationship between pre-dispatch price spike forecast and rebidding type

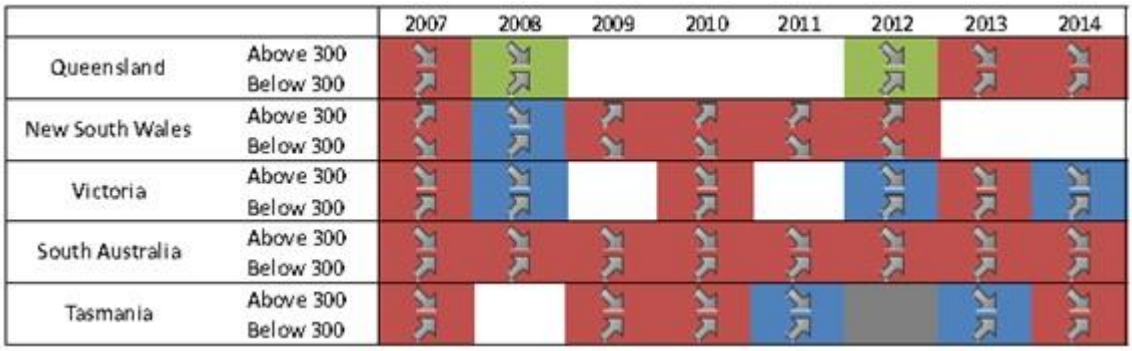


Table 4.7 shows the relationship between late rebids and actual pool price spikes. The table shows that a higher proportion of late rebids to price bands above $300/MWh can have both a positive and negative relationship with pool price spikes. The strongest relationships that indicate that a higher proportion of late rebids to high price

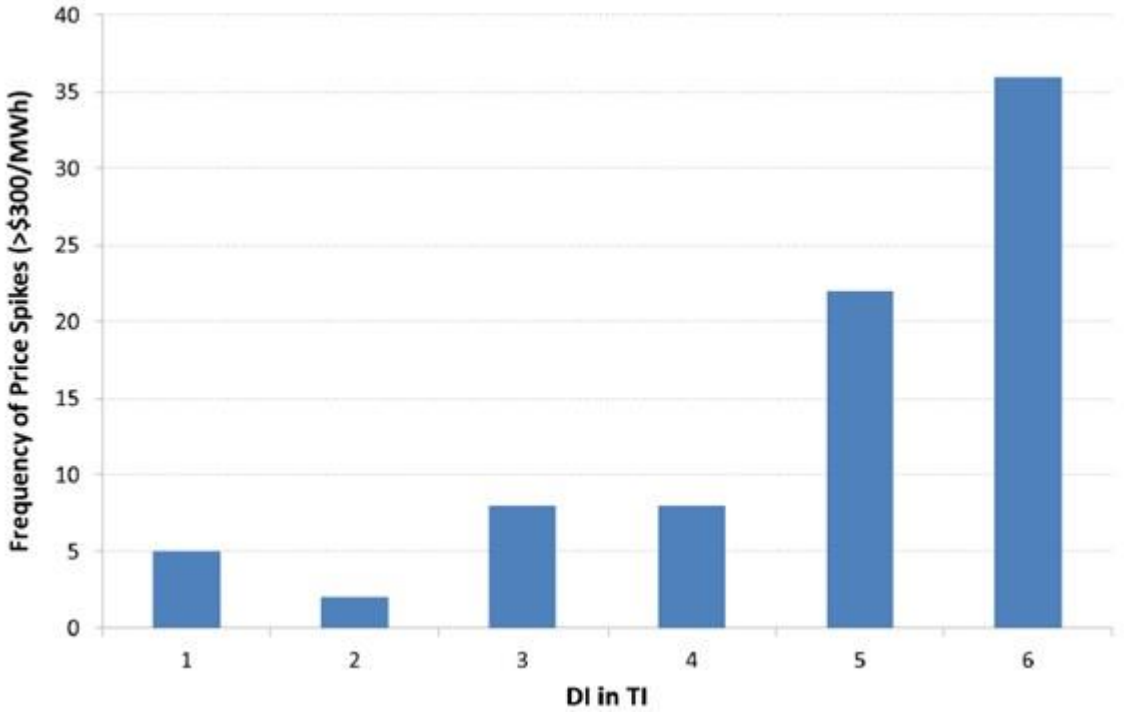
bands increases the likelihood of pool price spikes are in South Australia in 2013 and Queensland in 2014.

Table 4.7 Relationship between late rebidding type and pool price spikes[25]

	% Bids to Above 300:	2007	2008	2009	2010	2011	2012	2013	2014
Queensland	Late Rebids = Last DI	↘							↗
	Late Rebids = 30 mins	↘	↗		↘		↗		↗
New South Wales	Late Rebids = Last DI			↘	↘	↘			
	Late Rebids = 30 mins				↘			↗	
Victoria	Late Rebids = Last DI								
	Late Rebids = 30 mins	↘		↗			↗		
South Australia	Late Rebids = Last DI	↘	↘	↘	↘			↗	
	Late Rebids = 30 mins	↘		↘	↘			↗	
Tasmania	Late Rebids = Last DI	↗							
	Late Rebids = 30 mins	↗		↘	↘				↗

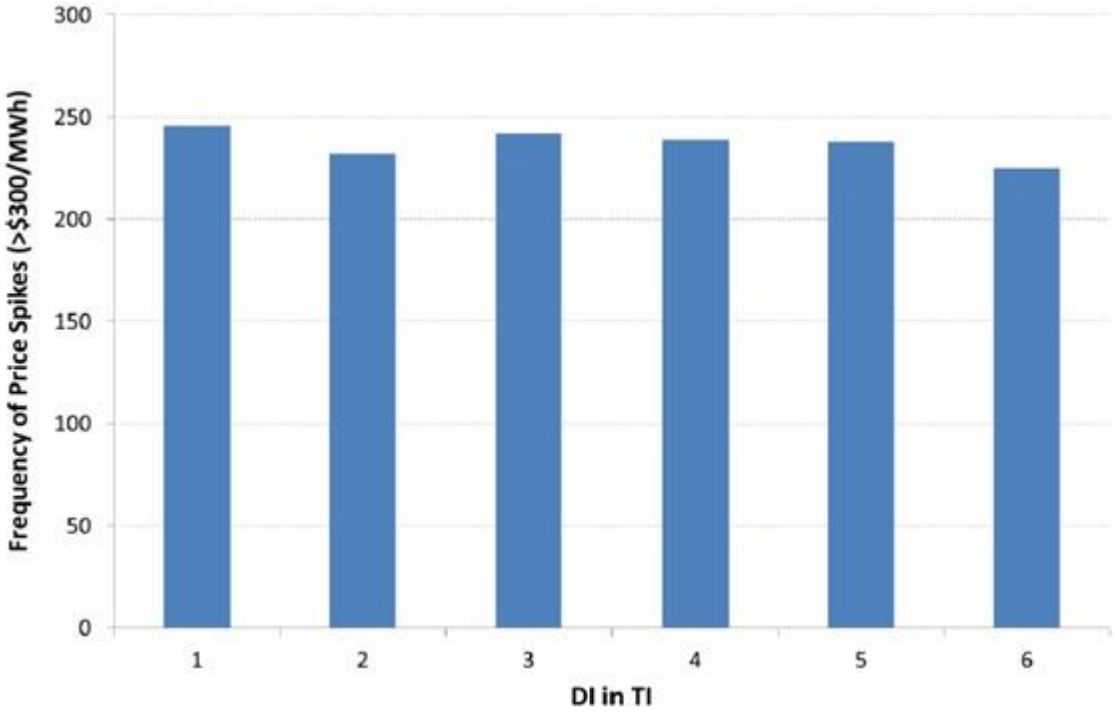
The high frequency of price spikes in the sixth dispatch interval is shown for Queensland in figure 4.4. This can be compared to figure 4.5 which shows the frequency of price spikes in the different dispatch intervals of trading intervals from 2007 to 2011. ROAM notes that this trend is not clearly identifiable in other regions of the NEM, with the possible exception of South Australia in 2013.

Figure 4.4 Price spikes in Queensland - January-July 2014



25 The types of late rebids shown includes late rebids made within the last dispatch interval prior to dispatch and late rebids made within the last 30 minutes prior to dispatch.

Figure 4.5 Price spikes in Queensland - 2007 to 2011



4.2 The impact of late rebidding on the ability of participants to respond

The AEMC engaged Oakley Greenwood to undertake an assessment of the extent to which generator bidding behaviour impacts on the ability of large users in the NEM to engage in demand side participation.

The objective of this assessment was to investigate the extent to which the rebidding activities of generators impact directly on wholesale market price outcomes and, as such, have the potential to affect the value received by end-use customers that provide demand response. The assessment included consultations with key organisations involved in the provision of demand response.

4.2.1 Key findings

Oakley Greenwood has found through its assessment that:

- full pool price exposure for large electricity customers is rare with participation in a retailer program or taking partial pool price exposure through a retailer being the most common arrangements used as the basis for providing demand response into the wholesale market;
- while there are few reliable estimates of the overall levels of demand response in the NEM, the current over-supply of generation capacity has reduced price volatility and created market conditions that are not particularly conducive to the take-up of demand response activities by end-use customers;

- a number of organisations consulted noted that, of the price volatility that does occur, the departures in price in the present market tend to occur at unusual times, are relatively short in duration, and tend to occur in the last one or two dispatch intervals of trading intervals;

- the majority of organisations consulted viewed these factors as making it difficult to predict or foresee with an acceptable level of accuracy when a period of sufficiently high prices to warrant the provision of a demand response is likely to occur and this has further contributed to a reduction in the amount of demand response that is available;

- some organisations considered such price spikes to be instances of market failure because they are caused by generators opportunistically making rebids and are unrelated to the genuine conditions of supply and demand in the market, while other organisations took the view that generators creating these price spikes have simply found a way to gain a competitive advantage and that the market will correct over time through participants seeking counteracting measures;

- virtually all of the organisations consulted considered that the instances in which prices have suddenly and significantly changed in the last one or two dispatch intervals is a recent phenomenon, occurring within the last two years and primarily in Queensland and South Australia; and

- there is a substantial level of interest from customers and intermediaries that are not currently providing demand response but are technically capable of doing so, with some additional and potentially significant emerging opportunities that are being driven by the changing Australian economy.

4.2.2 Methodology

Oakley Greenwood based its assessment on the knowledge and experience of its project team, relevant secondary sources, and through extensive individual consultations with key organisations.

A total of 22 organisations were consulted representing a broad cross-section of stakeholders including demand response aggregators and advisers, electricity retailers, individual large consumers of electricity, organisations that represent large energy users, and electricity distribution businesses.

Interviews were generally conducted in person with phone interviews undertaken in instances where face-to-face meetings were not possible.

The principal topics covered included:

- the amount and type of demand response currently made available in MWs;

- the operational characteristics of the demand response provided;

- the commercial arrangements under which the demand response is provided;

- factors of importance to end users when considering whether to enter into demand response arrangements;
- whether late rebidding has affected the amount or type of demand response provided; and
- how the experiences of providing demand response has changed over time.

4.2.3 Results from the assessment

The following section sets out the principal findings from Oakley Greenwood's assessment of the impacts of generator bidding behaviour on demand side participation in the NEM.

Current demand side participation in the NEM

Demand response is a change made in electricity consumption by a large volume consumer in response to real time conditions in the electricity supply chain. These conditions can be defined by:

- price (as in the case of wholesale market price, or a critical peak demand network price); or
- operating conditions (such as the need to control frequency or relieve congestion in a local area of a distribution network).

The consumer may be directly exposed to the price signal or may change consumption in response to a request from another party in the electricity supply chain.

It is typically only in conditions where demand response participation in the energy market is to reduce exposure to high spot prices that are likely to be affected by late rebidding.

The sources of demand response typically provided by participants are largely influenced by the nature of the participant's equipment and the operational characteristics of the facility. Demand response may be provided through:

- the use of an onsite generator to offset mains electricity consumption;
- the substitution of electricity with the use of another fuel on a temporary basis;
- load cycling or temporary consumption reduction; and
- load curtailment or rescheduling of load.

Typically, end users will be reluctant to make any substantial changes to operations or equipment to provide a demand response unless they also derive some additional benefits in production efficiency or the demand response can provide financial benefits with reasonable certainty and within a short timeframe.

Generally, the demand response that is initially provided by an end user will be the simplest and easiest opportunities available within the facility. Any incremental investments in further demand response will likely only occur if responding to the price signal or retailer call is not burdensome or where the financial returns are clear and reasonably certain.

The financial benefit accrued through the provision of demand response depends to a large extent on the nature of the commercial arrangements. There are several ways large energy users can provide demand response into the wholesale market.

Oakley Greenwood notes that participation in a retailer program or taking partial pool price exposure through a retailer are the most common arrangements used by large electricity customers as the basis for providing demand response into the NEM's wholesale market. Only three end-use customers in the history of the NEM have taken full pool price exposure as wholesale market customers, and only one customer based in South Australia is doing so at present.

Estimates of current demand response in the NEM

Oakley Greenwood notes that there are minimal reliable estimates of the relative proportions of different types of demand response currently active in the NEM. Further, the total level of demand response that is currently being exercised in the market is also difficult to assess for a number of reasons.

- Not all demand response is exercised in the market at the same time. A customer's ability or willingness to provide demand response on any particular occasion will depend on a number of factors beyond the market price, such as production requirements and commitment times.
- Disclosure of demand response information provides no commercial advantages to customers and may in fact pose a risk of commercial disadvantage.

Tables 4.8 and 4.9 show estimates developed by AEMO of the amount of demand response available by NEM region in winter and summer.[26]

Table 4.8 Estimated available demand response (MW) - Winter 2014

	QLD	NSW	VIC	SA	TAS
Prices > $300/MWh	49	18	45	39	0
Prices > $500/MWh	49	22	57	41	5
Prices > $1000/MWh	51	24	63	43	5
Prices > $7500/MWh	61	80	140	126	37
Prices = MPC	123	214	262	147	56

26 Oakley Greenwood, *The impact of late rebidding on the provision of demand response by large electricity users in the NEM*, 25 November 2014, p. 11. MW values in rows are cumulative.

Table 4.9 Estimated available demand response (MW) - Summer 2014-15

	QLD	NSW	VIC	SA	TAS
Prices > $300/MWh	49	18	65	39	0
Prices > $500/MWh	49	22	77	41	5
Prices > $1000/MWh	51	24	83	43	5
Prices > $7500/MWh	61	85	214	126	37
Prices = MPC	123	219	336	147	56

Late rebidding and the provision of demand response

Oakley Greenwood suggests that the current over-supply of generation capacity in the NEM is not particularly conducive to the take up of demand response activities by end use customers. The over-supply has resulted in historically low wholesale market prices, and a reduction in price volatility. This has meant there is significantly less revenue available over the course of a year from demand reductions that are undertaken at or above the level of price at which demand response generally enters the market.

However, a number of organisations consulted noted that, of the price volatility that does occur, the departures in price in the present market are different from those that have occurred previously. These differences include:

- significantly diminished relationship between supply/demand conditions and price than characterised the market previously;
- significant increases in spot price occurring at times they have not tended to occur in previous years;
- periods of high price being relatively short in duration as compared to previously; and
- those periods of significant price increase tending to occur in the last one or two 5-minute dispatch intervals of a given 30-minute trading interval.

The majority of the organisations that were consulted viewed these factors as making it difficult to predict or foresee with an acceptable level of accuracy when a period of sufficiently high price to warrant the provision of a demand response is likely to occur. Further, they felt that these short periods of high price would not normally be expected given the general supply and demand conditions at the time and are driven principally by the bidding behaviour of generators in a manner which is intended to increase revenue in the current subdued market environment.

The majority of organisations consulted consider that this bidding behaviour has further contributed to a reduction in the amount of demand response that is available, as the nature of the high price events entails greater levels of risk for demand response

providers. However, organisations consulted had substantially different views as to whether this should be considered as market price manipulation or rational economic behaviour.

Taking the former view were aggregators, specialist retailers and representatives of consumer organisations who consider that such price spikes should be seen as instances of market failure because they are unrelated to the genuine conditions of supply and demand in the market. They note that instances of late rebidding are generally undertaken by baseload generators that rebid a large volume of capacity to a very high price, typically towards the end of a trading interval. This action forces the price to be set by the next generator bid that meets the level of demand. By engaging in this behaviour, baseload generators are exploiting their position in the bid stack in the knowledge that no other generator can respond in time to the price signal. While it was noted that these strategies are not always successful at increasing the price, they still have the capacity to result in price spikes even at low levels of demand.

Those taking the latter view were generally retailers associated with generation businesses who consider that the generators engaging in the rebidding activity have simply found a way to gain a competitive advantage. The self-correcting nature of the market will arise through other participants seeking opportunities to counteract the behaviour.

A number of participants suggested that of most concern for demand response providers is when late rebidding results in high prices in the last one or two dispatch intervals of a trading interval. In these cases, the demand response will only have a counteracting effect if it can be activated very quickly. In addition, even if the demand response is quick to react, electricity will already have been consumed for the first four or five dispatch intervals when the market price was much lower and the energy already consumed will be exposed to the whole 30-minute settlement price for the trading interval.

These concerns have also been raised by peaking generators that need to generate at times of high market price to provide sufficient revenue to meet their obligations under sold cap contracts. Late rebids that occur towards the end of trading intervals can result in significant payouts without compensating pool revenue if they are unable to generate in time.

Some participants interviewed considered that peaking generators have an opportunity to reconfigure their plant to respond to price spikes at short notice, and that this is part of the self-correcting nature of the market. Other participants considered that such reconfigurations are likely to be inefficient and not in the long-term interests of consumers as they increase costs with no added benefits in the supply of electricity.

Oakley Greenwood consulted one generator that has reconfigured its plant to go from zero to full load in a few minutes. The generator considered that the additional capital expenditure and operational costs were justified on commercial grounds in order to increase plant flexibility.

The impact of late rebidding on the incentives for demand response

Oakley Greenwood concludes that current market conditions are very poor for demand response. All of the participants consulted were of the view that current returns in the market for the provision of demand response are inadequate. In addition, the current late bidding behaviour of generators increases the risks of participation in the market and the provision of demand response.

Virtually all of the organisations consulted considered that the instances in which prices have suddenly and significantly changed in the last one or two dispatch intervals is a recent phenomenon, occurring within the last two years and primarily in Queensland and South Australia.

In most cases, the occurrence of these price events is difficult to predict and generally only lasts around 5 to 15 minutes. The fleeting nature of these events means that only demand response resources that can be initiated very quickly can be used to any benefit. Aggregators and retailers that are relatively active in working with demand response participants consider that the only resources that are engaging in demand response any more are those that can deliver within 15 to 30 minutes.

Future implications for demand response

Oakley Greenwood suggests that while late rebidding may inhibit the active engagement of demand response in the NEM, there may be significantly more demand response available that is not being realised. They have determined through their consultations that there is a substantial level of interest from customers and intermediaries that are not currently providing demand response but are technically capable of doing so.

They note that these findings are consistent with other studies undertaken including a recent report published by ClimateWorks entitled *Industrial Demand Side Response Potential*.[27] The results from this study were derived from interviews conducted with 34 companies representing 26% of all industrial electricity consumption, and focused on their potential for and likelihood of providing demand response. Estimates of the additional potential demand response are shown in table 4.10.

The study estimated that somewhere between 3.1 and 3.8 GW of demand response is potentially available from industrial facilities across Australia, depending on the level of financial return available and effort and expense required. It was concluded that 95% of this additional potential could be available with a notice period of two to four hours, with limited requirement for additional investment. With a notice period of 30 minutes to one hour, this reduces to about 50%, and with a notice period of 15 minutes the additional potential is down to approximately 10%.

27 ClimateWorks, *Industrial demand side response potential – Initial findings and discussion paper*, February 2014.

Table 4.10 Estimates of demand response potentially available from industrial facilities across Australia[28]

Notice period	Potential demand response
Two to four hours	2.95 – 3.6 GW
30 minutes to one hour	1.55 – 1.9 GW
15 to 30 minutes	0.3 – 0.4 GW

Oakley Greenwood notes that changes in the Australian economy are likely to change this demand response potential over time. While the shrinkage of the manufacturing industry is likely to reduce the potential demand response available, there are other emerging opportunities such as pumping and compression of LNG in Queensland that show significant potential for demand response applications. As communications and control technologies improve, a quicker response from existing demand response is also likely to contribute.

4.3 The impacts and materiality of late rebidding in the NEM

This section discusses the impacts and materiality of late rebidding in the NEM, as evidenced from the research and analysis undertaken to date, and considers stakeholder views in submissions on the extent to which a case exists for making a change to the NER.

4.3.1 The materiality of the issues

Based on the outcomes of the analysis of wholesale market price impacts undertaken by ROAM, and the assessment of the impacts on demand side participation undertaken by Oakley Greenwood, the Commission considers that a number of conclusions can be drawn regarding the impacts and materiality of late rebidding by generators in the NEM.

While the NEM has maintained the same broad market design since commencement, the work undertaken by ROAM and Oakley Greenwood suggests that since 2007 the occurrence of late rebidding, and rebidding towards the end of trading intervals, has been a recent phenomenon, occurring within the last two years and predominantly in Queensland and to some extent in South Australia.

Although late rebidding quite often has a role to play in responding to price spikes in pre-dispatch forecasts and reducing anticipated market volatility, the recent late bidding behaviour in Queensland and South Australia has resulted in price spikes, specifically towards the end of trading intervals.

28 Oakley Greenwood, *The impact of late rebidding on the provision of demand response by large electricity users in the NEM*, 25 November 2014, p. 28.

The current over-supply of generation capacity has reduced price volatility and created market conditions that are not particularly conducive to the take-up of demand response activities by end-use customers. However, the recent prevalence of late rebidding may have contributed to a further reduction in the amount of demand response that is available by making it difficult to predict or foresee with an acceptable level of accuracy when a period of sufficiently high price to warrant a demand response is likely to occur.

Late rebidding has the potential to further inhibit future demand side activities. There is a substantial level of interest from customers and intermediaries that are not currently providing demand response but are technically capable of doing so, with some additional and potentially significant emerging opportunities that are being driven by the changing Australian economy.

The results from work undertaken by ROAM and Oakley Greenwood are broadly consistent with separate pieces of analysis performed by the AER and AEMO.

AER analysis

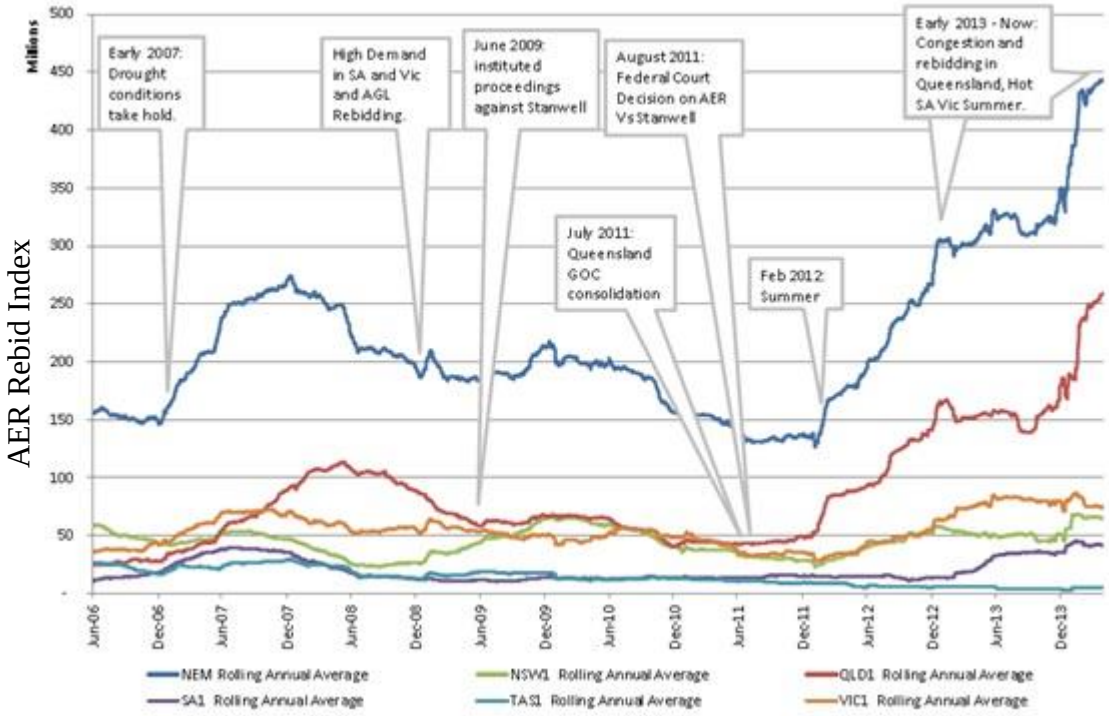
As part of its submission on the consultation paper, the AER developed a Rebid Index which provides a measure of the extent of rebidding activity that occurs close to the time of dispatch or towards the end of trading intervals, and which involves a movement of volume offered to high price bid bands.[29] The AER considers that the rebid index provides a measure of how quickly the value of energy offered in participants' rebids changes within the forecast period.[30]

The AER's Rebid Index, shown in figure 4.7, suggests that since the end of 2011, there has been a significant shift towards generators rebidding close to dispatch to increase the spot market price. This is particularly noticeable in the Queensland region of the NEM with other regions showing a flat or only slightly increasing trend relative to history.

29 AER, Submission on the consultation paper, pp. 5-9.

30 The Rebid Index is calculated by applying a weighting to all rebids and summing them. Greater weight is given to rebids that move a large volume of capacity from a low to high price band, are made close to a dispatch interval, or are made towards the end of a trading interval. For example, the AER notes that a rebid that shifted 500 MW by $10/MWh would be given the same weight in the calculation as a rebid that shifted 100 MW by $50/MWh but half the weight of a rebid that shifted 1000 MW by $10/MWh.

Figure 4.7 AER - Annual rolling average NEM and regional rebid index



AEMO analysis

AEMO has also undertaken some analysis on the wholesale market price impacts from late rebids.[31] AEMO's work was principally focused on assessing the price impacts of rebids that occur in the last dispatch interval of a trading interval. The analysis attempted to determine the materiality of late rebids that occur both generally and in the context of the difference between 5-minute dispatch and 30-minute settlement. The analysis quantified the price impacts of all trading intervals in the two years 2010 and 2013 where the sixth dispatch interval was at least 30% higher or lower than the average of the five remaining dispatch intervals. In this sense, rebids into both higher and lower price bands were examined.

Table 4.11 is taken from AEMO's analysis and shows a summary of the estimated impacts on annual average prices for each region of the NEM. The price impacts represent the difference between the actual price for the 30-minute trading interval and the average of the five remaining dispatch intervals. The average of the five remaining dispatch intervals is used to estimate the likely 30-minute price had the price spike in the last dispatch interval not occurred. This counterfactual assumes that, without the price spike, the price in the sixth dispatch interval would have been equal to the average of the five previous dispatch intervals. In the table, a negative number means a positive price impact, ie late rebidding has resulted in a higher annual average price.[32]

31 AEMO, *NEM 5 minute dispatch and 30 minute settlement – price impacts from late rebids*, 30 July 2014.

32 The negative number occurs because the average price for the five dispatch intervals is lower than the price for the 30-minute trading interval.

The most significant price impacts are in Queensland and South Australia in 2013. In most other cases, the price impacts have not been material and in fact have led to a price reduction in New South Wales in both 2010 and 2013 as well as in Victoria in 2013.

Table 4.11 AEMO analysis - impacts on annual average prices due to late rebids by year and region ($/MWh)

Year	NSW	QLD	SA	TAS	VIC
2010	$0.08	-$0.06	-$0.04	-$0.17	-$0.02
2013	$0.03	-$0.22	-$0.40	-$0.03	$0.08

Source: AEMO, NEM 5 minute dispatch and 30 minute settlement – price impacts from late rebids, 30 July 2014.
Note – a negative number represents an increase to the annual average price.

Impact of late rebidding on hedge contract prices

While the results of the analysis provided by the AER and AEMO are broadly consistent with the outcomes of the work undertaken for the Commission, it is important to note that the principal focus of all of these assessments has been on the impacts of late rebidding on price outcomes in the spot market. The Commission recognises that much of the impact on participants from late rebidding behaviour may in fact occur through the effect on the prices of financial hedge contracts.

As discussed in section 3.2.2, late rebidding may reduce the transparency and predictability of spot price outcomes. Time constraints that limit the ability of market participants to respond to the actions of others may mean that a competitive supply or demand side response cannot be assumed, thereby making it difficult for market participants to forecast spot prices, further reducing the efficiency of market outcomes. This may increase the costs of hedging required to manage price risk and may result in higher prices for consumers.

While the Commission has not attempted to quantify the impacts of late rebidding on the market price of hedge contracts, information from stakeholders evaluating this aspect of the market would be welcome.

4.3.2 Forming an appropriate regulatory response

Based on views expressed in stakeholder submissions on the consultation paper, and in consideration of the consultations with participants undertaken by Oakley Greenwood, the Commission notes that there is a considerable divergence of views amongst stakeholders as to whether late rebidding by generators represents a market failure and, if it does, whether the extent and materiality of this market failure is sufficient to require a regulatory response.

A number of stakeholders view late rebidding as inhibiting efficient and competitive market outcomes as it prevents others from responding in a timely fashion. These

stakeholders consider that the establishment of an equilibrium market price requires participants to have reliable forecasts against which to gauge their position and time to respond.[33]

Other participants suggest that it is not the inefficiency of any given price interval that should be the concern but whether an efficient market outcome is achieved over time.[34] The design of the wholesale market as a repeated auction process means that even if one price interval is inefficient, competitors can respond to move price outcomes to efficient levels over a longer term period. Strategic advantages that are gained through late rebidding are fleeting in nature and do not pose a fundamental issue for the market.

The Commission's view

An efficient functioning market need not provide an efficient price outcome in each and every dispatch interval. The iterative process of price discovery involves a dynamic process of participants learning and reacting to their competitors' actions. As such, overshoots and undershoots should be expected but over time the market should trend towards a longer-term equilibrium.

The Commission acknowledges that there will always be one generator that makes the last rebid for any given dispatch interval. A generator that misses out on making a rebid in response to the rebid of another generator will learn from the experience and adjust their strategy accordingly. However, technical limitations on the output of some generators may prevent this learning process from reaching an efficient equilibrium outcome if these generators are unable to provide an efficient physical response.

The efficient functioning of the price discovery process may be inhibited through generators exploiting the inability of some generators to physically respond. Generators that are already producing output may engage in late rebids that provide insufficient time for generators that are offline to ramp up to a level of output that is consistent with their offers already in the bid stack. This behaviour prevents generators that are offline from acting on their learnings and skews the market towards outcomes that are more favourable for those generators that are online and regularly being dispatched.

The technology and operational cost characteristics of different generators mean that certain generators are more often online than others. As such, bidding behaviour by these generators can entrench market outcomes that are more in line with their commercial interests.

While fast-response generators may seek to adjust operating regimes or invest in improvements to plant flexibility in order to more promptly respond to price spikes caused by late rebids, the fact that late rebids may result in inefficient market price

33 See submissions on the consultation paper from: AER, p. 1; EnerNOC, p. 2; ERM Power, p. 1; SACOSS, p. 6; Arrow Energy, p. 4; Westpac, pp. 1-2; MEU, pp. 22-25; Visy, pp. 6-9.

34 See submissions on the consultation paper from: CS Energy, p. 5; GDF Suez, p. 2; Alinta Energy, p. 5; EnergyAustralia, p. 5; ESAA, pp. 1-2; Origin Energy, p. 3.

outcomes suggests that any such additional expenditure may not represent an efficient outcome in itself. It is the inability of certain generators to physically respond in time that drives most of the impacts of late rebidding.

Regional considerations

While there is potentially room to develop an appropriate regulatory response to the behaviour demonstrated by generators, the Commission notes that this behaviour has not been manifested until recently and only in particular regions of the NEM.

The outcomes of the analysis conducted by ROAM show a statistically significant relationship in Queensland between instances of late rebidding and high demand, low import headroom, and the binding of the 855-871 constraint.[35] While the 855-871 constraint has recently been alleviated through network investment, the QNI constraint which prevents voltage collapse from the tripping of Kogan Creek Power Station continues to be prevalent at times of high market price in Queensland. The Commission also notes that the recent prevalence of late rebidding has coincided with generator ownership changes put in place by the Queensland government.[36]

While acknowledging evidence of the issues, the Commission would need to carefully consider any regulatory response which applied to all participants in the NEM to address an inefficiency that may be largely enabled by market and structural conditions specific to certain regions that might only be temporary. This is particularly the case if the regulatory response involves a compromise between reducing the inefficiencies created through generator bidding behaviour and reducing the efficiency of the iterative process of price discovery to reach an efficient market outcome.

Nevertheless, the Commission considers that the design of the market framework should set reasonable boundaries on the ability of participants to influence price outcomes that are to the detriment of other participants and that are inconsistent with an efficient functioning market. Such an approach would recognise the possibility that conditions conducive to late rebidding have the potential to arise in other regions of the NEM in the future.

35 On 4 February 2010, on advice from Powerlink, AEMO started using dynamic ratings for a number of transmission lines in Queensland, including the 855 Calvale – Stanwell and 871 Calvale – Wurdong lines. The change to dynamic ratings generally increased the capacity of the lines but on occasion, during hot periods with low wind, significantly and quickly reduced capacity ratings. Powerlink finished augmentation of the Calvale to Stanwell 275 kV line in Summer 2013-14 which saw an increase in supply capability between Central West Queensland and North Queensland. See: AEMO, *Electricity Market Event Report – NEM Operations Review – Queensland Summer 2012 (855/871 Congestion)*, 31 May 2012, p. 6.

36 On 1 July 2011, the then three state-owned Queensland generation businesses were consolidated into two businesses – CS Energy and Stanwell.

5 Options to address the issues identified

In its rule change request, the proponent proposed a number of changes to the good faith bidding provisions in clause 3.8.22A(b) of the NER to address the issues that it perceives exist with these provisions. In addition to the proposed rule, the Commission considers that there may also be other options to address these issues that also have the potential to contribute to the achievement of the NEO.

This chapter discusses the options to be explored that may address the issues identified in the rule change request.

5.1 Overview of the options

The options discussed in this chapter can be broadly classified as those based on the design of a behavioural statement of conduct, similar to the good faith bidding provisions, and those based on the design of the market and the bidding process, including restrictions on rebidding close to dispatch. Fundamental to the development of these options, and the assessment of the proposed rule, is a consideration of the behaviour that is sought to be prevented.

Behaviour to be addressed

The Commission considers that the specific behaviour to be addressed is generators submitting late rebids where there is an intention to exploit the limited opportunity of other participants to respond. A change in a generator's offers from a previous bid or rebid can mean that other participants do not have a sufficient opportunity to respond if the change is made close to dispatch.

In relation to this behaviour, the Commission considers there is a distinction that can be made with regard to the generator's intentions. The previous bid or rebid may be submitted in the knowledge that it would or could never be honoured. Alternatively, the generator may have an intention to honour its bid or rebid at the time it was submitted. In both cases, the generator has submitted the bid or rebid in the knowledge that a late rebid could be made should the opportunity arise close to dispatch.

This distinction in the intentions of the generator is likely to play a role in determining the appropriate structure of a behavioural statement of conduct. In addition, the Commission is considering the extent to which restrictions on rebidding close to dispatch may also be used to address this behaviour.

As such, the options discussed in this chapter should not be considered as mutually exclusive and the appropriate solution to the issues raised by the rule change request may involve elements of both.

A behavioural statement of conduct

As set out in its rule change request, the proponent has identified a number of issues with the current good faith provisions, mainly around the difficulty that it perceives in

the enforcement of these provisions. The Commission is considering the proposed rule and also other options for either changing the current good faith provisions, or developing a different behavioural statement of conduct to address the bidding and rebidding strategies that have been identified to be of some concern.

These alternative options include:

1. Leaving the good faith provisions unchanged.

2. Removing the part of the good faith provisions that refers to a change in material conditions and circumstances.

3. Replacing the good faith provisions with another behavioural statement of conduct that prohibits a market participant from making offers, bids or rebids which are misrepresentative of its capability to achieve if dispatched, or which mislead other participants and exploit the limited opportunity of other participants to respond.

The exact structure of the statement of conduct will play a key role in determining the enforceability of the provisions in preventing the specific adverse behaviour.

Restrictions on rebidding close to dispatch

As discussed, in addition to a behavioural statement of conduct, it may also be possible to place restrictions on the types of rebids permitted within a certain window of time prior to dispatch occurring. A mechanism that places restrictions on rebids close to dispatch is typically referred to as 'gate closure'.

The determination of an appropriate form of gate closure requires the consideration of the trade-off that exists between:

- the promotion of an iterative process of price discovery and the flexibility of the market to respond to changing market conditions; and

- limiting the ability of participant rebids to disproportionately influence price outcomes close to dispatch.

The level of restrictions on types of rebids and the window of time over which these restrictions apply are both factors that determine the compromise between these two competing drivers of market efficiency.

Review of regulations in overseas jurisdictions

In order to determine the form of regulations to guide appropriate generator behaviour, and to design potential options for restricting rebidding close to dispatch, information can be drawn from the design of similar regulations observed by CEG in its comparative assessment of overseas jurisdictions.

As discussed in section 2.3, the AEMC engaged the CEG to undertake a review and comparative assessment of regulation relating to rebidding activity in six separate

overseas jurisdictions. Energy-only real-time markets surveyed included Alberta, Singapore and New Zealand. Jurisdictions with real-time and day-ahead markets were also considered including France, Texas (ERCOT) and PJM.[37]

5.2 A behavioural statement of conduct

This section discusses the purpose of a behavioural statement of conduct in promoting efficient market outcomes.

5.2.1 The purpose of a behavioural statement of conduct

Generator bidding behaviour is currently regulated in the NER through the good faith bidding provisions, which can be described as a behavioural statement of conduct. Clause 3.8.22A of the NER provides that:

1. Market participants must make a dispatch offer, dispatch bid or rebid in relation to available capacity and daily energy constraints in good faith;

2. A dispatch offer, dispatch bid or rebid is taken to have been made in good faith if, at the time of making the dispatch offer, dispatch bid or rebid the market participant had a genuine intention to honour that dispatch offer, dispatch bid or rebid if the material conditions and circumstances upon which the dispatch offer, dispatch bid or rebid was based remain unchanged until the relevant dispatch interval; and

3. A market participant may be taken to have contravened the good faith requirement by inference from the conduct of the relevant market participant or the relevant circumstances.

The rule change proponent considers that the Federal Court decision in the Stanwell case highlighted the practical enforcement limitations of the current good faith provisions.[38] The proponent is concerned that the implication of the Federal Court decision in the Stanwell case is that, in order to establish an absence of good faith, the AER must prove that the generator had a positive intention not to honour the bid at the time of making the bid. The proponent considers that this places a substantial burden of proof on the AER and undermines the purpose of the good faith bidding provisions. In order to address the perceived limitations, one of the proposals the proponent made in its rule change request, was to provide greater clarity on the meaning of bidding in good faith.

An issue with the practicality of the proposed rule is that it prohibits rebids that are based on the subjective expectations of a generator. An inability to base rebids on a change in subjective expectations runs counter to the process of efficient price discovery. As discussed in section 3.1.2, a rebid based on an expectation that does not

37 The PJM also includes a capacity market in addition to a real-time market and day-ahead market.

38 South Australian Minister for Mineral Resources and Energy, *Proposed rule change – bidding in good faith*, 13 November 2013, pp. 2-3.

eventuate may be equally valid in the promotion of efficient prices as a rebid based on an objective or observable change in market conditions.

However, this does not suggest that there ought to be no regulation around appropriate bidding conduct. The Commission considers that there is the potential for benefits to be had from regulations that guide appropriate generator behaviour. A behavioural statement of conduct may encourage generators not to engage in deliberate bidding strategies that are intended to create false expectations. Such regulations encourage generators to submit meaningful initial bids that broadly reflect their market intentions and not to undertake late rebids that intentionally exploit the limited opportunity for other participants to respond.

The intentions of the rebidding generator

As discussed in section 3.2.3, there is a trade-off that exists between the provision of meaningful initial bids on the one hand and facilitating the process of price discovery to achieve efficient market outcomes on the other.

The incentives that unrestricted rebidding can have on the provision of less meaningful initial bids can also provide opportunities for generators to mislead other participants.[39] Misleading conduct could arise from actions that, through the initial bid, influence the expectations of other participants. An initial bid could provide market participants with a false expectation of the generator's intentions, which could then subsequently be exploited through a late rebid that relies on the physical non-responsiveness of competitors. A late rebid may mean that technical limitations prevent certain generators and demand side participants from enacting a production response with limited time available.

Bidding behaviour which misleads other participants need not only arise through a generator's initial bids but could be applied to any circumstance where a generator's existing offers to the market are not reflective of its intentions. With respect to its offers and rebids, the Commission considers that the following distinction is important with regard to the development of options to address this form of behaviour.

1. Submitting a previous bid or rebid that the generator does not intend to honour under any circumstances or is misrepresentative of its capability to comply with if dispatched.

2. Engaging in a pattern of behaviour of submitting bids and rebids that have the potential to be honoured but which create false expectations among market participants as to the intentions of the generator at dispatch.

In both cases, bids or rebids may be submitted which are subsequently changed through a late rebid that exploits the limited opportunity for other participants to respond. However, there is a distinction in relation to the specific intentions of the previous bid or rebid.

39 Professor George Yarrow and Dr Chris Decker (Regulatory Policy Institute), *Bidding in energy-only wholesale electricity markets*, December 2014, p. 16.

In the first case, the bid or rebid is submitted in the knowledge that it would or could never be honoured. The generator has submitted the bid or rebid to deliberately mislead participants regarding its true intentions at dispatch. The generator either knows that it will not honour the bid or rebid or is incapable of honouring the bid or rebid.

In the second case, the generator may have an intention to honour its bid or rebid at the time it was submitted. However, the intention of the rebidding generator is to make the bid or rebid in the knowledge that a late rebid could be made should the opportunity arise close to dispatch. In this case, the misleading behaviour is not attributable to any individual instance of a late rebid. The fact that the generator makes a late rebid does not imply that the generator did not intend to honour the previous bid or rebid, either at the time of making the previous bid or rebid, or at any time up to the point at which it made the late rebid. As such, the adverse behaviour would only be evidenced through a repeated pattern over time of submitting bids or rebids that were not honoured due to a subsequent late rebid.

The Commission considers that in both cases there is potential for the process of efficient price discovery and the operation of the NEM to be undermined. However, given the differences in intentions described, the options to address these behaviours may be different.

5.2.2 Regulations that currently govern participant behaviour in the NEM

In order to determine the appropriate form of regulations to guide generator bidding behaviour, it is useful to look at relevant Australian legislation that governs other areas of market behaviour, recognising that such statements are rare.

In most cases these provisions are expressed by reference to the effect of the relevant conduct, rather than the intention or purpose of the relevant person in undertaking that conduct. Where intention is relevant, these provisions will generally also include provisions allowing an objective assessment of intention or be supported by a body of jurisprudence on how intention is to be inferred.

The Competition and Consumer Act 2010 and the abuse of market power

Anti-competitive practices in Australia are prohibited under the *Competition and Consumer Act 2010* (CCA).[40] Market Participants are subject to the CCA, and the CCA prohibits most forms of anti-competitive behaviour. There is therefore no need to replicate the provisions of the CCA in the NER.

The prohibitions under the CCA are both purpose (intent) based and effects based i.e. the prohibitions under the CCA apply to:

40 The provisions of the *Trade Practices Act 1974* have been superseded by the *Competition and Consumer Act 2010*.

- conduct having the purpose of substantially lessening competition or the purpose of preventing or deterring competitive conduct; and
- conduct having the effect or likely effect of substantially lessening competition.

In the context of the NEM, it might be difficult to describe any prohibited effects of bidding and rebidding in the NEM. Market outcomes are often the culmination of the behaviour of all market participants, and it can be difficult to link the actions of any one participant to a particular market outcome.

The CCA prohibits a range of anti-competitive behaviours, including the misuse of market power. Section 46 of the CCA provides as follows:

46 Misuse of market power

1. A corporation that has a substantial degree of power in a market shall not take advantage of that power in that or any other market for the purpose of:

    (a) eliminating or substantially damaging a competitor of the corporation or of a body corporate that is related to the corporation in that or any other market;

    (b) preventing the entry of a person into that or any other market; or

    (c) deterring or preventing a person from engaging in competitive conduct in that or any other market.

Section 46 is an intent based prohibition, i.e. the prohibited conduct is that which has the purpose of eliminating or damaging a competitor or preventing a person from engaging in competitive conduct etc.

Subsequent subclauses of section 46 provide guidance as to the application of this prohibition. Provisions similar to section 46 have been enacted in State and Territory legislation pursuant to the Competition Code Agreement.

Conduct only breaches section 46 if each of the following elements is established:

- the corporation has a substantial degree of power in a market;
- the corporation took advantage of that market power; and
- it did so for one of the proscribed anti-competitive purposes.

'Taking advantage' of market power involves engaging in conduct which a corporation would not engage in without that market power.

The CCA does not prohibit the existence of market power. It also does not prohibit a corporation from exercising its market power unless it does so for an anti-competitive purpose.

In other words, section 46 prohibits a corporation holding a substantial degree of market power from taking advantage of that market power for the purpose of substantially damaging a competitor, preventing the entry of a person into a market, or preventing a person from engaging in competitive conduct.

This approach acknowledges that, under workable competition, corporations may experience transitory periods where they are able to influence the market price. However, over time this ability is expected to be competed away by existing or potential competitors, driving the market towards efficient outcomes. In contrast, a sustained ability to influence the market price may drive a wedge between efficient costs and prices, leading to persistent inefficiencies in the market. It is conduct resulting from market power in this latter case that raises concerns.

Market power and late rebidding

This distinction between a transitory and sustained ability to influence the market price was recognised in the AEMC's approach to its 2013 final determination on the rule change request submitted by the Major Energy Users (MEU) in relation to the exercise of market power by generators in the NEM.[41] The AEMC made the distinction between:

- 'substantial market power', which involves sustained pricing above the level that would prevail in a workably competitive market; and
- 'transient pricing power', which involves a transient ability to increase prices above costs for short periods of time.

The Commission considers that transient pricing power is an inherent feature of a workably competitive market such as the NEM and is not synonymous with late rebidding. While both involve a transient ability to increase prices above estimated costs for short periods of time, transient pricing power does not preclude the occurrence of competitive demand and supply side responses. EnerNOC provided a similar view in its response to the consultation paper that, in the case of late rebids, timing issues mean that consumers are unable to exercise choice, and new suppliers entering the market would make no difference to this pricing behaviour.[42]

Transient pricing power is only a concern if it occurs frequently enough and to a significant magnitude that it leads to wholesale prices that are sustained above the long-run marginal cost of new generation capacity and that barriers to entry exist that prevent or increase the costs of new investment.

Other provisions in the CCA

Some other provisions of the CCA, ie prohibitions on anti-competitive agreements and exclusive dealing, apply an effects test and prohibit conduct that has the effect or likely effect of substantially lessening competition.

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41 AEMC, *Potential Generator Market Power in the NEM - Final Determination*, 26 April 2013.

42 EnerNOC, Submission on the consultation paper, pp. 3-4.

To assess the effects of particular conduct it is necessary to compare the circumstances that occurred with the conduct (the factual) and what would have happened without the conduct (the counterfactual).

The problem in applying such an effects test to rebidding in the NEM is that it is difficult to provide an objective standard for conduct that is detrimental to the market.

For this reason, the main objective standard adopted under the CCA – ie "substantially lessening competition" – may not be an effective test for rebidding in the NEM, given that:

- the measure of the anti-competitive effect must be "substantial", in the sense of being "meaningful" or "relevant" to the competitive process. This rules out effects which are merely transitory, fleeting or ephemeral. Late rebidding strategies tend to cause short-term price spikes, and it may be difficult to prove its impact on longer run investment incentives in the NEM "are substantial"; and

- there may be a view that late rebidding does not have the effect of lessening competition at all. Rather, the situational lessening of competition shortly prior to a dispatch interval may simply be a feature of a market where there are technical constraints on adjusting generation capacity and where bids can be made right up to the start of the relevant dispatch interval. Late rebidding merely takes advantage of that feature of the market and the technical capabilities of the market participant's plant.

The CCA provides a useful example of how difficult it is to prescribe and enforce a behavioural rule, either expressed by reference to a person's intentions, or by reference to the effects of a person's activities. The CCA is subject to a large body of jurisprudence, yet is still ambiguous and subject to argument.

Further, the ability to apply CCA-style effects tests to the NEM is likely to be difficult. The CCA is focused on enduring monopoly and cartel situations of market power, and requires "substantial" effects. The nature of the NEM, where market power may be fleeting and a counterfactual is difficult to establish, does not lend itself to a ready comparison.

Box 5.1 Harper Competition Policy Review[43]

The practical difficulty in applying the CCA is evidenced by the recommendations in the draft report of the Harper Competition Policy Review Panel. The Panel has undertaken a detailed analysis of Australia's competition laws, and has proposed a number of reforms to simplify and remove unnecessarily complex laws and processes, while retaining the underlying policy intent of the CCA. This includes the suggestion of moving from an intent based test to an "effects test" for determining misuse of market power.

The Panel regards the central element of "taking advantage of market power" as

43 See www.competitionpolicyreview.gov.au

difficult to interpret and apply in practice. It has suggested in its draft report that the primary prohibition on a corporation that has a substantial degree of power in a market in s46 be re-framed from:

1. taking advantage of that power for a prohibited purpose (ie eliminating or substantially damaging a competitor, preventing the entry of a person into that market or preventing a person from engaging in competitive conduct in that or any other market); to

2. engaging in conduct if the proposed conduct has the purpose, or would have or be likely to have the effect, of substantially lessening competition in that or any other market.

The Panel is currently consulting on its suggested changes to s46 and other recommendations in its draft report, and will be publishing its final report to the Australian Government in March 2015.

The Australian Consumer Law and misleading and deceptive conduct

The Australian Consumer Law (ACL) is a schedule to the CCA and is administered by the ACCC. The ACL is a national law for fair trading and consumer protection and applies at all Australian businesses.

Section 18 of the ACL states that:

> "A person must not, in trade or commerce, engage in conduct that is misleading or deceptive or is likely to mislead or deceive."

There are broadly three elements to establishing a contravention of this provision:

- conduct in "trade or commerce";
- the conduct was misleading or deceptive (or likely to mislead or deceive) in the circumstances; and
- loss or damage was caused by the conduct.

It is likely that the submission of bids or rebids by market participants would constitute conduct in trade and commerce.

A representation as to intention is misleading or deceptive if:

- the maker of the representation did not genuinely hold that intention; or
- where the representation is in respect of a future matter, the maker does not have reasonable grounds for making the representation.

Generally, conduct will be misleading or deceptive where it is inconsistent with the truth and thereby induces or is capable of inducing error. In determining whether conduct is misleading or deceptive, the court will undertake a two-step analysis:

- first, it is necessary to characterise the meaning and nature of the representation that is made by the conduct in question; and

- secondly, it is necessary to ask whether, as a question of fact, the representations conveys are false, misleading or deceptive, or likely to mislead or deceive.

It is arguable that a bid or rebid submitted to AEMO conveys a representation as to the minimum price at which the bidder is willing to supply generation capacity, subject to any subsequent rebids permitted under the NER. However the question of what meaning is conveyed by the bid or rebid would usually be resolved by looking at how the representation would reasonably be understood by other market participants. The surrounding circumstances are of great significance in determining the issue.

In the context of the NEM, the following is relevant:

- the representations are made to AEMO and potentially, other market participants in the NEM;

- AEMO and other market participants have detailed knowledge of the NER (particularly, what bids and rebids are permitted), the operations of the NEM (given the period for which the NEM has now been operational) and the nature of generator bidding and rebidding; and

- under the NER, rebids may be submitted "in good faith" up until the start of the relevant five-minute dispatch interval by moving capacity between the nominated price bands. A bid or rebid is taken to be in good faith if there is a genuine intention to honour the bid or rebid if the material conditions and circumstances remain unchanged. A trader's subjective intention could be a material condition or circumstance (ie it is open for a market participant to rebid if its expected outcomes are not achieved).

These above circumstances narrow the ability of AEMO and market participants to rely on a bid or rebid as a representation. A bid or rebid would not generally be considered a representation that the bidder is unconditionally willing to supply generation volume at the bid price, given that this would be an uncommercial response to a change in market conditions and that rebids are permitted under the NER. Any bid or rebid must be viewed in the context of the NER and the ability of market participants to then subsequently rebid.

Therefore the misleading or deceptive conduct provision in section 18 of the ACL appear to provide little material assistance to the development of a behavioural statement in prohibiting or restricting strategic bidding or rebidding practices in the NEM. Any representation that is conveyed by a bid or rebid would need to be interpreted against the backdrop of the NER, the various changing and unknown circumstances and the ability of market participants to rebid. While market

participants may form their own view regarding the general intentions of a participant from its market offers, they might have difficulty claiming that they can justifiably rely on preliminary dispatch schedules and forecast pricing, and were therefore misled or deceived by individual bids or rebids.

However, a bid or rebid may be misleading or deceptive if it was made in bad faith – that is, the bidder did not intend at all (in any circumstances) to honour that bid. This could include where the market participant had no ability to technically or legally dispatch its plant to meet the relevant bid.

5.2.3 Regulations in other areas of Australian law

In addition to the CCA and ACL which govern general participant behaviour, it is useful to look at behavioural statements of conduct in other Australian legislation. One such area is the *Corporations Act 2001* which regulates the behaviour of participants in financial markets.

The Corporations Act 2001 and market manipulation

Consideration has previously been given to the possibility of rules that emulate the style and intent of the provisions established under Corporations Law to manage market manipulation.[44]

The *Corporations Act 2001* contains a number of provisions dealing with market manipulation and related conduct. These provisions relate to "financial products" (which includes shares, bonds, debentures and derivatives).

Section 1041 of the *Corporations Act 2001* prohibits a person from taking part in, or carrying out a transaction that has or is likely to have the effect of creating an "artificial" price for trading in financial products, or maintaining prices or financial products at an artificial level.

The section also covers false trading and market rigging, including the creation of a false or misleading appearance of active trading and artificially maintaining a trading price, and making false statements or disseminating information that may be misleading.

Definitions of 'market manipulation' and 'artificial price' have had limited testing in court. However, previous rulings have found occasions where the provisions have been breached.[45]

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44 Letter from the Queensland Minister for Mines and Energy (Hon. Tony McGrady) to NECA, *National Electricity Code – Withdrawal of Queensland derogation regarding rebidding*, 27 September 1999, p. 4.

45 Corrs Chambers Westgarth, Andrew Lumsden and Stan Lewis, *Market manipulation – what is an "artificial price" and why does it matter?*, 14 February 2014, viewed 8 December 2014, <www.corrs.com.au/thinking/insights/market-manipulation-what-is-an-artificial-price-and-why-does-it-matter/>

In Director of Public Prosecutions (Cth) v JM [2013] HCA 30, the High Court identified the following principles concerning the interpretation of section 1041A:

- The references in section 1041A to a transaction which has, or is likely to have, the effect of creating an "artificial price", or maintaining the price at a level which is "artificial", include a transaction where the buyer or seller of shares undertook it for the sole or dominant purpose of setting or maintaining the price at a particular level. Such a transaction does not reflect genuine forces of supply and demand.

- Section 1041A prohibits transactions that are likely to have the effect of creating or maintaining an artificial price for trading in shares. It is not necessary to demonstrate, whether by some counterfactual analysis or otherwise, that such a transaction did create or maintain an artificial price.

- It is also not necessary to proffer some additional proof that such a transaction went on to affect the behaviour of genuine buyers and sellers in the market in order to demonstrate that the transaction had, or was likely to have, the effect of creating or maintaining an artificial price.

- Proof of a sole or dominant purpose of setting or maintaining a price is not a separate element of this offence, but merely one way of demonstrating that a transaction was at least likely to have the effect of setting or maintaining an artificial price.

In the context of energy markets, section 1041 applies to the trading of electricity derivative products but does not extend to the trading of physical energy in the wholesale market.

As discussed, late rebidding has the potential to prevent the occurrence of competitive participant responses and therefore may result in price outcomes that do not reflect the forces of genuine supply and demand.

However, while the concepts in the *Corporations Act 2001* provide a useful example, it might be challenging to apply these concepts to the NEM in practice. Offers and bids in the NEM are not referenced to cost or any other factor and market participants are free to offer capacity within a large range of values (including negative). Accordingly, it might be difficult to say that a bid or offer is "artificial" or maintains an "artificial" price without clarifying what is artificial and what is not.

The Commission notes however, that recently in the United States, the US Federal Energy Regulatory Commission (FERC) entered into a stipulation and consent agreement with JP Morgan in relation to allegations of violations of section 222 of the US Federal Power Act. FERC determined that JP Morgan altered market prices from the prices that would have resulted had the company not engaged in its activities. FERC alleged that the bids were not "grounded in the normal forces of supply and demand" but were made on the basis of receiving "make whole" payments. This is discussed further in the next section and in Box 5.2.

5.2.4 Regulations in overseas jurisdictions

Further insight might be gained from looking at the design of behavioural regulations observed by CEG in its comparative assessment of overseas jurisdictions. In doing so however, it must be recognised that regulations in overseas jurisdictions have developed around the specific designs of those markets, and that behavioural conduct provisions in other areas of Australian law have been developed to regulate specific market behaviours and will have a body of jurisprudence developed about the legal meaning of those provisions.

In its review, CEG observed that all of the markets it surveyed were found to have some mechanism or rule to provide for bids that are meaningful at the time they are made.[46] Real-time energy-only markets surveyed, including Alberta, Singapore and New Zealand, are similar to the NEM in that they contain provisions that govern generator bidding behaviour to ensure that bids reflect a genuine intention of generators to supply at the submitted price. These markets rely on the efficiency of price signals in real time to drive the efficiency of investments.

These regulatory jurisdictions share a number of general features of market governance of electricity markets:

- each jurisdiction has introduced 'liberalised', or market based arrangements, for wholesale electricity transactions over the past two decades – each jurisdiction has established a form of organised market for wholesale electricity exchange transactions;
- the wholesale electricity markets in these countries all operate under an umbrella of general competition law which prohibits abuse of market power and price fixing (that is, they operate under similar trade practices regimes to the CCA);
- all jurisdictions have seen the development of wholesale electricity markets that involve overlapping regulatory authorities as well as cross jurisdiction trading, and hence potentially overlapping rules on market behaviour; and
- as with established exchanges for other commodities and derivatives, all contain rules on trader conduct, market behaviour and orderly markets, in addition to the generic competition statutes.

In Alberta, the wholesale market is regulated by various provincial rules and regulations which include the ISO rules and the Electric Utilities Act (EUA).[47] Conduct that seeks to increase profits by weakening or eliminating competition may lead to an investigation and enforcement action if it is considered to be systematic in nature. This includes conduct which 'enhances the effect of a unilateral offer strategy by engaging in transactions where the primary purpose is to reduce the response from competitors to customers'. The Market Surveillance Administrator (MSA) refers to this as

46 The Competition Economists Group, *International review of rebidding activity and regulation*, December 2014, p. 4.

47 Ibid, p. 21.

"extension" and notes that the conduct must be done with the "primary purpose" of inhibiting a competitive response.

The Singapore Electricity Act prohibits actions which aim to or have the effect of preventing, restricting or distorting competition in the wholesale electricity market, including fixing prices and limiting or controlling electricity generation, and any conduct which amounts to the abuse of a dominant position to the prejudice of consumers.[48]

The New Zealand electricity market has recently seen the introduction of trading conduct provisions with 'safe harbour' principles.[49] The amendment requires generators to observe a high standard of trading conduct. While there is no definition of a 'high standard of trading conduct', compliance with the three 'safe harbour' provisions will mean automatic compliance with the requirement. The three 'safe harbours' require that a generator offers all of its available capacity, that it revises its offers in a timely manner after receiving information that triggers the revision, and that it does not act to increase the price or benefit financially from an increase in the price at times when it is pivotal to the market.

While the trading arrangements in the electricity market in France are substantially different to the NEM, CEG investigated the recent introduction of the European Union regulation on wholesale energy market integrity and transparency (REMIT), which prohibits insider trading and market manipulation in wholesale energy markets and establishes a monitoring regime for wholesale energy trades.[50] The development of these prohibitions was based on criminal offences that already exist in financial markets around market manipulation and insider trading. As such, the REMIT regulations act to bridge the gap between the existing regulations of conduct in financial markets and the trade of physical products on wholesale gas and electricity markets. REMIT has been in force in wholesale energy markets across the EU since 28 December 2011.

Under the REMIT regulations, attempts to manipulate the wholesale market include:

- transactions which give, or are likely to give, misleading signals as to the supply of, demand for, or price of wholesale energy, or attempts to secure the price at an artificial level;
- employ or attempt to employ a fictitious device, or other form of deception or contrivance, which is likely to give misleading signals; and
- disseminate information which gives, or is likely to give, misleading signals, where they knew, or reasonably should have known, that the information was misleading.

48 Ibid, p. 40.

49 Ibid, pp. 45-48.

50 Ibid, pp. 63-66.

The UK Department of Energy & Climate Change (DECC) has recently published a consultation paper on the introduction of REMIT to the UK energy markets.[51] In the implementation of REMIT, DECC considers that a fault element for market manipulation would be necessary to ensure proportionality in applying sanctions and as a marker that the behaviour is truly blameworthy.[52] The prohibited activities for market manipulation would have to be conducted either intentionally or recklessly. DECC considers that only targeting intentional behaviour would be insufficient, as it would fail to adequately capture some of the damaging behaviours that could distort a market undertaken by those who know that their activity may have such an effect.

Similar to the development of the REMIT regulations, section 222 of the US Federal Power Act draws upon terms used in the regulation of financial markets to regulate market manipulation in the trade of physical energy.[53] Section 222 prohibits an entity, directly or indirectly, from employing any manipulative or deceptive device or contrivance in connections with the purchase or sale of electric energy.

FERC has recently undertaken a number of enforcement actions for alleged breaches of section 222 of the US Federal Power Act.[54] In July 2013, FERC found Barclays to have manipulated energy markets in California by engaging in trades that were not consistent with supply and demand conditions in the market. In mid-2013, FERC approved a form of settlement agreement with JP Morgan. FERC found that JP Morgan had engaged in fraudulent bidding behaviour that allowed it to achieve above market prices for supplying energy. JP Morgan was accused of employing a number of bidding strategies that were designed to create artificial conditions that forced the Independent System Operator (ISO) to pay JP Morgan outside the market at premium rates.

Box 5.2 FERC enforcement actions

Barclays

In July 2013, the US Federal Regulatory Commission issued an order imposing penalties on Barclays for alleged market manipulation. The alleged conduct was said to have occurred between November 2006 and December 2008. FERC imposed penalties of Barclays of US$34.9 million for the disgorgement of profit and a US$435 million civil penalty. FERC also imposed penalties on individual traders, with three traders fined US$1 million and one trader fined US$15 million for his central role in the alleged market manipulation.

FERC alleged that the market manipulation occurred in a number of locations served by Barclays' Western Power trading desk, including in Arizona, Northern

51 UK Department of Energy & Climate Change, *Strengthening the regulation of wholesale energy markets through new criminal offences*, August 2014, pp. 7-8.

52 Ibid, p. 25.

53 The Competition Economists Group, *International review of rebidding activity and regulation*, December 2014, pp. 83-87.

54 Ibid, pp. 87-88.

California and Southern California. Barclay's traded in these locations on the Intercontinental Exchange (ICE).

FERC alleged that Barclays' Western Power trading desk "engaged in a coordinated scheme to trade next-day fixed-price physical power to move the ICE daily index settlement to benefit Barclay's fixed-for-floating financial swap positions that settled against those indices".

FERC alleged that Barclays' Western Power trading desk commonly took 'opposite' positions in the physical and financial markets. That is, Barclays would buy financial swaps at a fixed price and sell its position in the physical market at the ICE Index price. Barclays would then buy back its position in the physical market to raise the ICE Index price in favour of its financial swap position. FERC considered that Barclays' physical trading position was intentionally unprofitable on its own and amounted to market manipulation.

JP Morgan

The US Federal Energy Regulatory Commission entered into a stipulation and consent agreement with JP Morgan in relation to allegations of violations of section 222 of the US Federal Power Act.[55] In this agreement, JP Morgan agreed to pay $410 million in penalties and disgorgement for allegations of market manipulation stemming from the company's bidding activities in electricity markets in California and the Midwest. The case was settled out of court, and while it admitted the facts as set out in the stipulation and consent agreement, JP Morgan did not admit or deny the allegations of violations of section 222 of the US Federal Power Act.

FERC found that JP Morgan has engaged in fraudulent bidding behaviour that allowed it achieve above market prices for supplying energy. FERC alleged that the bids were not "grounded in the normal forces of supply and demand" but were made on the basis of receiving "make whole" payments from the California Independent System Operator (CAISO) and the Midcontinent Independent System Operator (MISO).

The market design in the California and Midwest markets are different from the design of the NEM. CAISO and MISO operate both day-ahead and real-time markets for energy. The day-ahead market operates one day ahead of the date on which the energy actually flows through power lines, while the real-time market operates on the day the energy is transmitted, and prices and dispatch levels are resolved shortly before the hour in which the energy is delivered.

In both markets, "make whole" payments are made to generators if their plant is dispatched but the price in the real-time market is lower than the price that they bid in the day-ahead market. Make whole payments are compensation to the generator to make sure that it is paid at least its bid price in the day-ahead

55 Federal Energy Regulatory Commission, *Order approving stipulation and consent agreement – JP Morgan Ventures Energy Corporation*, 30 July 2013.

market.

FERC alleged that JP Morgan employed a number of bidding strategies to take advantage of the make whole payments, resulting in CAISO and MISO paying JP Morgan outside the market at premium rates. FERC investigators determined that JP Morgan's bids displaced other generation and altered day-ahead and real-time prices from the prices that would have resulted had the company not submitted the bids.

5.3 Options for a behavioural statement of conduct

This section considers potential options for a behavioural statement of conduct, including changes and alternatives to the good faith bidding provisions.

There are a number of potential changes that could be made to the current good faith bidding provisions to address concerns that those provisions do not adequately regulate generator bidding behaviour in the NEM. These options are discussed further below and include:

1. Leave the good faith provisions unchanged.

2. Remove the part of the good faith provisions that refers to a change in material conditions and circumstances.

3. Replacing the good faith provisions with another behavioural statement of conduct that prohibits a market participant from making offers, bids or rebids which are misrepresentative of its capability to achieve if dispatched, or which mislead other participants and exploit the limited opportunity of other participants to respond.

In each case, the exact form of wording used in the statement of conduct will need to be developed in consideration of the specific behaviour that is being sought to be prevented and will play a key role in determining the enforceability of the provisions.

5.3.1 Option 1: Keeping the good faith provisions unchanged

One option is to keep the existing good faith provisions unchanged. Clause 3.8.22A(b) of the NER is not the subject of a significant body of jurisprudence, and the only available court decision on the issue of the obligation on a generator to make bids and rebids in good faith was the *Australian Energy Regulator v Stanwell Corporation Limited*. This decision highlighted the difficulty with enforcing clause 3.8.22A(b). However, a number of stakeholders have suggested that a single unsuccessful prosecution does not imply there is a problem with the current rules.[56] They note further that the existing powers under section 28 of the NEL already provide the AER with comprehensive investigatory and information gathering powers, and that this is sufficient to enforce the good faith bidding provisions.

56 NGF, Submission on the consultation paper, p. 11.

However, keeping the good faith provisions unchanged would appear to be inconsistent with the concerns raised by the rule change request. The proponent considers that the implication of the Federal Court decision in the Stanwell case is that, in order to establish an absence of good faith, the AER must prove that the generator had a positive intention not to honour the bid at the time of making the bid. The proponent considers that this places a substantial burden of proof on the AER and undermines the purpose of the good faith bidding provisions.

It appears that there are two principal elements to the current good faith provisions. The first element is for generators to submit bids and rebids that reflect their genuine intentions at the time. The Commission considers that there are substantial benefits to be gained from market offers that reflect the intentions of a generator.

The second element is to clarify that bids and rebids will be taken to be made in good faith if at the time of making the bid or rebid the market participant has a genuine intention to honour the bid or rebid if the material conditions and circumstances upon which the bid or rebid were based remain unchanged until the relevant dispatch interval. The proposed rule attempts to support this objective by requiring that rebids be made as soon as reasonably practicable following the relevant change in material circumstances. This would prevent generators using a change in material circumstances that occurred some time ago as evidence of making a late rebid in good faith.

The Commission considers that there may be potential inefficiencies associated with generators engaging in late rebids. However, the Commission has concerns around the practicality of the good faith provisions to discourage late rebidding and to require a market participant to make a rebid as soon as it becomes aware of a change in the material conditions and circumstances upon which it based its bid. A rebid based on an expectation that does not eventuate may be equally valid in the promotion of efficient prices as a rebid based on an objective or observable change in market conditions, it may be difficult in practice to infer the basis upon which the generator made a rebid.

5.3.2 Option 2: Remove the requirement from the good faith provisions for there to be a change in the material conditions and circumstances upon which the bid was based

The Commission considers that a generator should be permitted to change its market offers at any time to reflect a shift in its expectations. However, at the time it makes an offer it should have an intention to honour the offer.

Therefore, an alternative option may be to remove the reference in the good faith provisions to a 'change in material conditions and circumstances' but retain the requirement that generators must have a genuine intention to honour their bids and rebids at the time they are made. This would leave clause 3.8.22A as a general "good faith" obligation. The Commission considers that such a statement would have the benefit of simplicity and would capture bids and rebids submitted by generators to which they have no intention of honouring under any circumstances or are misrepresentative of their capability to comply with if dispatched.

While this option would have the benefit of simplicity, it may be difficult to apply in practice. Good faith and intentions are entirely subjective concepts and difficult to enforce. A change of this nature would continue to leave open the issue of the meaning of "good faith". For any good faith prohibition to be effective, it would need to be clear exactly what behaviour the rebidding process is intended to allow or not allow.

In addition, any number of factors may legitimately adjust a market participant's intentions and justify a market participant rebid, including bids from other market participants, changes in weather or expected demand, forecast prices, fuel supply and pricing and plant technical and safety issues. It could be very difficult to prove that a bid or rebid was not made in good faith except for circumstances where it was impossible for the market participant to have responded to a dispatch instruction resulting from the bid. This may be because the relevant plant was never physically available, or the market participant was subject to other constraints that would have prevented the levels of generation offered (eg limits imposed by environmental licences, planning approvals or fuel supply arrangements).

It would also be very difficult to prove or disprove that a generator did not in fact have a genuine intention to honour its bids when they were made.

Further, this option may have limited practical benefit in addressing the ability of generators to exploit the physical non-responsiveness of other participants through late rebids. As discussed in section 5.1, the fact that a generator makes a late rebid does not imply that the generator did not have an intention to honour its previous bid or rebid. The generator may have an intention to honour the previous bid or rebid up to the time at which it made the late rebid. The specific behaviour to be targeted in this instance is a pattern of similar behaviour over time to which this option would not apply.

5.3.3 Option 3: Replace the good faith provisions with another behavioural statement of conduct

A behavioural statement of conduct would aim to permit generators to change their offers but deter behaviour that intentionally misleads other participants by creating false expectations only to exploit the limited opportunity of other participants to respond through a late rebid just prior to dispatch. Such behaviour undermines the efficient price discovery process by casting doubt on the reliability of market information.

As such, a third option may be to develop an alternative statement to the good faith provisions that specifically references the behaviour that is being sought to be prevented. While careful consideration would need to be given to the exact terms and form of wording used, the purpose would be to develop a statement of conduct that prohibits behaviour which is deceptive, misleading or misrepresentative of a market participant's technical or legal capability to comply with a dispatch instruction, or which undermines the efficient operation of the market.

As discussed in Section 5.2.2 above, given the circumstances in the NEM, the misleading and deceptive conduct provision in section 18 of the ACL are not overly helpful in the development of a behavioural statement prohibiting or restricting strategic bidding or rebidding practices in the NEM. Any representation that is conveyed by a bid or rebid would need to be interpreted against the backdrop of the NER, the various changing and unknown circumstances and the ability of market participants to rebid. Market participants would have difficulty claiming that they can justifiably rely on preliminary dispatch schedules and forecast pricing, and were therefore misled or deceived by individual bids or rebids.

However, a bid or rebid may be misleading or deceptive if it was made in bad faith – that is, the bidder did not intend at all (in any circumstances) to honour that bid. This could include where the market participant had no ability to technically or legally dispatch its plant to meet the relevant bid.

In order to address the specific behaviour of generators submitting late rebids where there is an intention to exploit the limited opportunity of other participants to respond, it is likely that an alternative form of words to the good faith provisions would be required.

As discussed above, it would be difficult to prove or disprove that a generator did not in fact have a genuine intention to honour its bids when they were made. As such, this behavioural statement would not relate to any individual instance of rebidding. Rather, it would seek to prevent generators from engaging in a repeated pattern of bidding behaviour that provides limited opportunities for other participants to respond and which undermines the efficient operation of the market.

One option may be to prohibit bidding behaviour that has, or is likely to have, the effect of creating an artificial price. However, as discussed in section 5.2.2, there may be practical difficulties in applying this to the NEM. Offers and bids in the NEM are not referenced to cost or any other factor and market participants are free to offer capacity within a large range of values (including negative). Accordingly, it would be difficult to say that a bid or offer is "artificial" or maintains an "artificial" price without clarifying what is artificial and what is not.

Therefore, it is more likely that the behavioural statement of conduct would focus on the intentions of the rebidding generator to engage in a pattern of behaviour over time which influences price outcomes to the detriment of other participants or consumers and that is inconsistent with an efficient functioning market.

Behaviour that is unintentionally misleading

Further consideration may also need to be given as to whether the behaviour was deliberately misleading or misrepresentative of what a market participant could technically or legally achieve if dispatched, or whether it would be sufficient to prove that the actions of the generator could likely have led to the creation of false expectations, regardless of their specific intentions.

As discussed in section 3.2.3, misleading conduct has the potential to impair the efficacy of the price discovery process by casting doubt on the reliability of market information. However, late rebidding also has the potential to prevent the occurrence of competitive participant responses and therefore may result in price outcomes that do not reflect the underlying conditions of supply and demand. These inefficient price outcomes may occur irrespective of the specific intentions of the late rebidding generator.

As such, statements of conduct could be developed which target generator behaviour that could likely have led to the creation of false expectations. This would capture damaging bidding behaviour undertaken by those who should reasonably know that their activity may have such an effect.

Such regulations would likely be more enforceable as the regulations would be focused more on the observable actions of the generator as opposed to determining their specific intentions. However, such regulations would also risk penalising generators that made a rebid close to dispatch where there was a genuine need to do so, or which would have led to a more efficient price outcome.

5.4 Restricting rebidding close to dispatch

This section discusses alternative options to address the issues raised in the rule change request that are based on the design of the bidding process, including restrictions that may be applied to rebids within a window of time prior to dispatch.

5.4.1 The purpose of restricting rebidding close to dispatch

As discussed in section 5.1, a behavioural statement of conduct would specifically target bidding behaviour by generators that is aimed at intentionally misleading other participants or creating false expectations which undermine the efficient functioning of the price discovery process. However, irrespective of the generator's intention to mislead other participants, late rebidding also has the potential to prevent the occurrence of competitive participant responses and therefore may result in price outcomes that do not reflect the underlying conditions of supply and demand. As such, a statement of conduct would not address all instances of inefficiencies in market outcomes that late rebidding can create through disruptions to the price discovery process.

To address the inefficient market outcomes that are created through late rebids, it may be possible to place restrictions on the types of rebids permitted within a certain window of time prior to dispatch occurring. A mechanism that places restrictions on rebids close to dispatch is typically referred to as 'gate closure'.

The determination of an appropriate form of gate closure requires the consideration of the trade-off that exists between:

- the promotion of an iterative process of price discovery and the flexibility of the market to respond to changing market conditions; and

- limiting the ability of participant rebids to disproportionately influence price outcomes close to dispatch.

The level of restrictions on types of rebids and the window of time over which these restrictions apply are both factors that determine the compromise between these two competing drivers of market efficiency.

Discussion of rebidding restrictions in the rule change request

This trade-off was discussed in the rule change request where it was noted that restrictions on rebidding close to dispatch would not recognise that there may be changes in market circumstances where it would be acceptable to respond by rebidding.[57] The proponent considered that the inclusion of a requirement for a participant to rebid as soon as practicable after the change comes to its attention is designed to ensure the rebid is made in a timely manner and would not restrict generators from rebidding when there is a genuine need to do so.

The Commission considers that a principal issue with this proposed approach is that market participants may perceive different periods of time as reasonable. The period of time that a generator may practically require to form a response strategy and undertake a rebid may be influenced by a number of factors, including:

- the trader's time to develop a response strategy and formulate rebids;
- the generating company's internal processes for approving changes to bidding strategies; and
- the ability to dynamically incorporate changes based on rebids that other generators may be undertaking on the basis of the same change in material conditions and circumstances.

It is possible that a generator may identify a number of related events upon which to change its bidding strategy. If these events occur sequentially then this raises a question as to which individual event should be referenced as the period of time from which a rebid must be submitted.

5.4.2 The potential effects of rebidding restrictions

Imposing restrictions on rebids prior to dispatch can have the effect of merely shifting the relevant rebidding activity forward in time. Depending on the level of rebidding restrictions imposed, a gate closure would shift the deadline by which time all rebids must be made and so would not solve the inability of generators to rebid in response to

57 South Australian Minister for Mineral Resources and Energy, *Proposed rule change – bidding in good faith*, 13 November 2013, p. 12.

a late rebid. Yarrow notes that a shift in the time by which rebids must be made may simply see a flurry of rebidding activity prior to the new deadline.[58]

However, the ability of generators to undertake a rebid in response to a competitor's rebid is not the only form of response that can increase the efficiency of market outcomes. The purpose of gate closure would be to support the ability of participants to undertake a physical response to a late rebid. Depending on the window of time prior to dispatch to which the rebidding restrictions apply, gate closure would provide time for:

- fast-response generators to synchronise and generate in accordance with their existing market offers in the bid stack;
- demand side participants to make an economic decision to reduce consumption in response to high prices.

By providing for these forms of physical responses, gate closure would reduce the incentives on generators to make a late rebid that was intended to exploit the non-responsiveness of competitors.

Five-minute dispatch and 30-minute settlement

In addition, depending on the exact design of the gate closure mechanism, the ability of generators to undertake late rebids that specifically target dispatch intervals towards the beginning and end of trading intervals would be diminished. As discussed in section 3.2.2, due to the settlement price being determined over the half-hour trading interval, rebids that increase the dispatch interval price towards the beginning of a trading interval may mean that supply or demand responses occur later in the trading interval when the market no longer signals a need. Further, rebids that increase the dispatch interval price towards the end of a trading interval may mean that demand side participants are unable to determine purchasing costs until well after consumption has occurred.

5.4.3 Gate closure in overseas jurisdictions

CEG made some general observations through its survey of overseas jurisdictions, including:[59]

- all markets surveyed recognise the importance of having credible and meaningful bids submitted as early as possible to allow for accurate pre-dispatch forecasting and to provide certainty and predictability to those participants that may wish to respond through the demand side; however

58 Professor George Yarrow and Dr Chris Decker (Regulatory Policy Institute), *Bidding in energy-only wholesale electricity markets*, December 2014, p. 26.

59 The Competition Economists Group, *International review of rebidding activity and regulation*, December 2014, p. 5.

- it is equally recognised that the ability to change market offers close to the time of dispatch allows for price outcomes that more closely reflect market conditions at the time of dispatch.

All markets surveyed impose a gate closure period after which rebidding is not allowed or limited to certain circumstances. Markets recognise the trade-off that exists between the market certainty provided through an early gate closure and giving market participants time to respond to changing market conditions. There is a recognition that gate closure does not remove the potential for late rebidding, as it simply moves the deadline for rebids to be submitted earlier, but that it does provide a longer period of notice for the demand side to respond to high market prices. Table 5.1 sets out the current gate closure restrictions applied in the jurisdictions surveyed by CEG.

Table 5.1 Current gate closure restrictions in jurisdictions surveyed by CEG

Jurisdiction	Gate closure restrictions	Gate closure timing	Market price cap
Alberta, Canada	Volume changes may be made after gate closure but only for "acceptable operational reasons"	Two hours before settlement interval	C$999.99/MWh
Singapore	Offers may be changed after gate closure for operational reasons but are subject to market surveillance investigation	65 minutes before dispatch	S$4,500/MWh
	No rebids allowed	Five minutes before dispatch[60]	
New Zealand	Changes to bids or offers after gate closure must be for a genuine physical reason	Two hours prior to the trading interval	No explicit cap, however a scarcity pricing mechanism provides an effective cap of NZ$20,000/MWh
France	No changes to offers permitted	45 minutes before delivery	€3,000/MWh
Texas (ERCOT)	No changes to offers permitted	One hour before the operating hour	US$7,000/MWh. If recovery in a year is high then price cap may be reduced to US$2,000/MWh
PJM	Offers are locked in subject to transmission security constraints, reserve	6pm the day before	US$1,000/MWh. A shortage pricing mechanism allows the

60 In Singapore, dispatch quantities are calculated for each half-hour trading period.

Jurisdiction	Gate closure restrictions	Gate closure timing	Market price cap
	requirements and generator unit availability		price cap to rise to US$2,700/MWh

In the Singapore NEMS, offer variations are not to be submitted within 65 minutes of dispatch, except where it is intended to:[61]

- reflect expected ramp rate profiles during periods following synchronisation or preceding desynchronisation;
- reflect revised capability during a forced outage; or
- contribute positively to the resolution of a system energy surplus or shortfall situation.

The New Zealand Energy Authority also imposes restrictions on rebids close to dispatch.[62] The New Zealand electricity rules stipulate that rebids may only be permitted within two hours of dispatch if they relate to a genuine physical reason or if the system operator has issued a formal notice of a grid emergency. In Alberta, generators may change their offered volumes after gate closure only if it relates to an acceptable operational reason, including the safety of the generating asset or public, the repositioning of the asset to serve the stand-by operating reserves market, or to manage physical or operational constraints or an occurrence of force majeure.[63]

In all of the observed markets, rebids that fall outside of the permitted categories are still incorporated by the market operator into the determination of market dispatch. However, the relevant authority may review all rebids that it suspects may not have complied and may request additional information from the rebidding generator in order to substantiate the reasons provided for the late rebid. Offer variations after gate closure made under circumstances falling outside the defined exceptions are considered rule breaches and enforcement action may be taken. Penalties may be imposed in circumstances where it is considered that the additional information provided does not sufficiently justify the rebid.

Experience obtained from enforcing the gate closure period in Singapore has led the Energy Market Company to conclude that it is "imperative that the rules set out the forms of offer changes permissible after gate closure so as to minimise gaming opportunities".[64]

61 The Competition Economists Group, International review of rebidding activity and regulation, December 2014, pp. 32-33.

62 Ibid, p. 44.

63 Ibid, p. 16.

64 Ibid, p. 33.

5.5 The design of a gate closure mechanism

The consideration of any form of gate closure in electricity markets requires the determination of two separate but interdependent aspects of design:

1. the level of restrictions that determine the types of rebids that are permitted; and

2. the time prior to dispatch when the restrictions would start to apply.

The development of a gate closure mechanism must consider the interrelationships between these design aspects.

Table 5.2 lists the options potentially available in each of these two design aspects. Options based on the level of restrictions may be matched with options based on the time over which restrictions apply to determine an appropriate gate closure mechanism. A complete prohibition on rebidding might be consistent with a relatively short time period of gate closure (ie A1), whereas a longer notice period might allow for some rebids under a wider range of specifically defined circumstances (ie D4). Each of the options listed is discussed further below.

Table 5.2 Options for the design of a gate closure mechanism

Restrictions	Timing
A. No rebids permitted B. Rebids permitted that relate to physical prevention or safety, only for the affected generating unit C. As a consequence of issues related to physical prevention or safety at a generating unit, rebids may be permitted for any other generating unit within the generator's portfolio D. Rebids permitted that relate to certain technical characteristics of generating plant E. All rebids permitted but with increased reporting requirements	1. Restricted rebids do not apply to any dispatch interval within the current trading interval 2. Restricted rebids do not apply to any dispatch interval within the current trading interval or the subsequent trading interval 3. Restricted rebids do not apply to the next six dispatch intervals 4. Restricted rebids do not apply to any dispatch interval within the current trading interval or the subsequent three trading intervals

5.5.1 Restrictions on types of rebids

The level of restrictions that can be placed on rebids sits on a spectrum from the complete prohibition of all forms of rebids at one end to the ability to rebid any aspect of a commercial or technical nature at the other end.

Fewer restrictions on rebids close to dispatch recognises that there may be late rebids which have the potential to improve the efficiency of market outcomes. However, this

comes at the expense of providing less certainty to fast-response generators and demand side participants that face time constraints on their production responses.

Options for restricting rebidding in the NEM

Currently, the only restrictions that are placed on rebids in the NEM are that a brief, verifiable and specific reason must be provided with each rebid made, and the price allocated to each of the ten bid bands must be fixed in the initial bids. In the context of the international electricity markets surveyed by CEG, the NEM places a substantially lower level of restrictions on generator rebids close to dispatch.

Given the range of rebids that generators can make in relation to the commercial and technical characteristics of their generating plant, there is consequently a broad range of restrictions that could be imposed.

Strict prohibition on rebids

Firstly, it is possible that a complete prohibition on rebidding within a period of time prior to dispatch could be applied. AEMO's validation systems would simply prevent any rebids being accepted within the defined period. In this case, changes in technical or operating conditions of the plant may mean that generators would not conform to the dispatch targets provided by AEMO.[65]

Rebids permitted that are related to physical prevention or safety

Alternatively, rebids could be permitted for reasons related to safety or if plant is physically incapable of meeting its dispatch requirements. In this case, AEMO systems would accept rebids made within the window of time, however a specific reason that relates to physical prevention or safety would be required.

Whether or not a rebid in fact relates to an issue of safety of physical prevention would involve an element of subjective judgement. As such, the restrictions may be difficult to accurately enforce. However, the benefit of this approach is that it allows generators to adjust their market offers to reflect changed operating conditions, which may lead to a more efficient market outcome.

Consideration would need to be given as to whether a generator would only be permitted to make a rebid for the affected generating unit, or if this could be extended to permit rebids for any generating unit within the generator's portfolio.

Rebids permitted with certain technical characteristics

A further approach could be to include rebids that have a commercial aspect but with technical characteristics, such as tube leaks or environmental restrictions that influence generation output. This would provide a greater degree of flexibility to the generator to change their market offers on the basis of the technical operating limitations of their

65 In accordance with clause 4.9.8(a) of the NER, a registered participant must comply with a dispatch instruction given to it by AEMO unless to do so would, in the registered participant's reasonable opinion, be a hazard to public safety or materially risk damaging equipment.

generating plant. However, while fewer restrictions on rebids close to dispatch provides a greater scope for rebids to be made that may be beneficial to the market, it may be difficult in practice to differentiate rebids based on technical or commercial drivers. In addition, this may also provide greater scope for technical justifications to be devised in response to commercial incentives.

Rebids permitted with additional reporting requirements

Consistent with the current condition of market monitoring, an alternative to placing greater restrictions on rebids close to dispatch could be to increase the reporting requirements on generators. A window of time prior to dispatch would still apply, but any rebids made that apply to dispatch intervals within this period of time would require a report to be provided to the AER, setting out in detail the reasons for the rebid. In effect, this is asking the rebidding generator to identify the material conditions or circumstances upon which their rebid was based, recognising that a market expectation which did not eventuate may in fact be the basis for the rebid.

This option would have the benefit of allowing for rebids to be made where there is a genuine need but would not entirely prevent the ability of generators to make late rebids. However, late rebidding behaviour that is characterised by an intention to exploit the non-responsiveness of competitors is often part of a strategy of repeated attempts, many of which may fail to achieve financial benefit. The requirement to report separately on each rebid undertaken would impose an additional compliance burden on generators which may create a disincentive to employ such a strategy.

Box 5.3 The history of rebidding restrictions in the NEM

A number of alternatives to the existing rules regarding rebidding have been proposed in the past. Indeed, at the conception of the NEM, and the first drafting of the Code, there was some deliberation around the extent to which rebidding would be allowed as part of the NEM design.[66]

The ACCC was concerned that the use of rebidding for anti-competitive behaviour would most likely be last minute shifting of generation volume into higher price bands or withdrawal of capacity from the market. Ultimately, the ACCC determined that there was a higher cost to the market of not allowing rebidding up until the time of dispatch and determined that the dynamic nature of the supply of electricity meant there had to be flexibility in the bidding process to cover the contingency that plant may become unavailable, or extra plant may be required.

However, in making its determination, the ACCC considered a number of options that would have placed restrictions on rebidding in order to avoid the possibility of anti-competitive behaviour. These included disallowing rebidding of generation volume into different price bands within three trading intervals prior to dispatch, only allowing rebidding that has the effect of depressing spot

66 ACCC, *Applications for authorisation – National Electricity Code*, 10 December 1997, pp. 60-69.

prices, or only allowing rebidding for bona fide technical reasons. Ultimately, the ACCC determined to allow rebidding with a condition of market monitoring that would assess the impact of rebidding activity on spot market price outcomes.[67]

5.5.2 The time from which rebidding restrictions would apply

In a general sense, there is a simple trade-off to be observed in determining the appropriate window of time prior to dispatch in which restrictions on rebids should apply. A long window of time provides more certainty to fast-response generators and demand-side participants that face time constraints on their production response. However, this comes at the expense of prohibiting a greater number of rebids which have the potential to improve the efficiency of market outcomes.

As discussed above, this trade-off is also heavily influenced by the level of restrictions on rebids that apply within the window of time prior to dispatch. As such, a long period of time over which restrictions apply may justify fewer restrictions on rebids, while a short window of time may allow for much tighter restrictions.

Timing restrictions in overseas jurisdictions

This trade-off has been at the heart of the development of gate closure mechanisms in overseas jurisdictions. While the Texas ERCOT imposes gate closure one hour prior to dispatch, Alberta and New Zealand both impose a gate closure period of two hours.

In 2006, the Singapore NEMS shortened the gate closure period from two hours to one hour in order to enable market participants to react to changing market or plant conditions closer to real time and to help moderate price spikes in tight supply situations.[68] However, it was noted at the time that the shortened gate closure period would not provide sufficient time for offline generating units to be brought in as they generally take at least two hours to run up.

The rationale for the shorter period of rebidding restrictions in the Singapore market was that it would encourage more responsive rebidding based on the most recent market information. Further, it would reduce a generator's risk of being in an adverse position relative to its hedge contract obligations by allowing it to correct sudden changes in its physical position through trading closer to real-time.

Options for timing restrictions in the NEM

As part of the assessment of demand side engagement in the NEM, Oakley Greenwood consulted with participants on the concept of gate closure.[69] Most organisations considered that the timing of the gate closure would be critical. The restrictions would

67 ACCC, *Amendments to the National Electricity Code – Changes to bidding and rebidding rules*, 4 December 2002, pp. 5-6.

68 The Competition Economists Group, *International review of rebidding activity and regulation*, December 2014, pp. 31-32.

69 Oakley Greenwood, *The impact of late rebidding on the provision of demand response by large electricity users in the NEM*, 25 November 2014, pp. 34-35.

need to be applied early enough to allow other generators and customers with demand response capability to respond, but short enough to allow bids to be based on as good information as possible about supply and demand conditions. Estimates from research undertaken by Oakley Greenwood suggest that physical responses on the demand side can be inhibited by late rebids occurring anywhere from 10 minutes to two hours prior to dispatch.

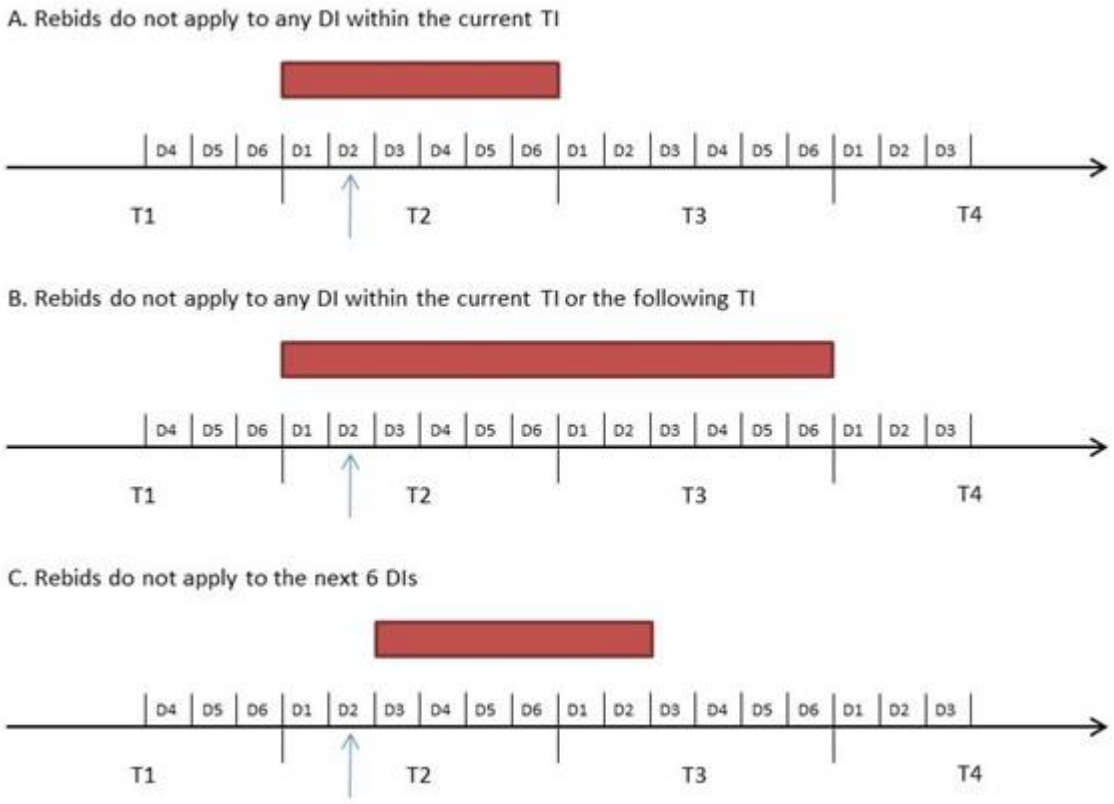
One option would be to impose a two-hour gate closure period prior to dispatch. This would provide sufficient time for the prevailing forecast pre-dispatch price to be considered and most competitive demand and supply side responses in the market to be initiated. However, depending on the level of rebidding restrictions that are applied over this period, the flexibility of the market to respond to changing conditions may be substantially reduced. Given the potential variability of supply and demand conditions that can typically be observed in the NEM, a two-hour gate closure period may regularly see price outcomes that deviate significantly from efficient levels.

A shorter gate closure may capture a large number of competitive demand and supply side response while maintaining sufficient market flexibility to respond to evolving market conditions. A 30-minute gate closure was suggested by Visy and EnerNOC as a potential compromise in their submissions on the consultation paper.[70]

Figure 5.1 illustrates three options that could be considered for applying a shorter window of time prior to dispatch in which rebidding would be restricted. Each of the three options is set out on a timeline of four trading intervals (T1 to T4) each of which contains six dispatch intervals (D1 to D6). The red bars represent the periods over which the restrictions apply and the blue arrow identifies the current dispatch interval.

70 See submissions on the consultation paper from: Visy, p. 3; EnerNOC, pp. 9-10.

Figure 5.1 Possible timing of restrictions on rebids



Option A restricts rebids from applying to any dispatch interval within the current trading interval. This is effectively a variable gate closure which ranges from 30 minutes at the start of the trading interval to zero at the end.[71]Depending on the level of restrictions that would apply, the intention of this option would be to prevent generators making late rebids within the trading interval, specifically those that apply to the last or second last dispatch intervals.

Option B is an extension of option A in that it restricts rebids from applying to any dispatch interval within the current trading interval but also restricts rebids that apply to the subsequent trading interval. Similar to option A, this is a variable gate closure which ranges from 60 minutes at the start of the first trading interval to 30 minutes at the start of the second trading interval. The intention of this option would be to prevent generators making late rebids within the trading interval and would also prevent rebids that apply to the first one or two dispatch intervals of the next trading interval.

Option C attempts to avoid the variability in timing of the two other options by ensuring that there is always a window of six dispatch intervals prior to dispatch to which the rebidding restrictions apply. A rolling window of time has the benefit of restricting late rebids that apply both towards the end and beginning of trading intervals. While the window of time in option C is based on the number of dispatch intervals in a trading interval, the window could be extended to any number of

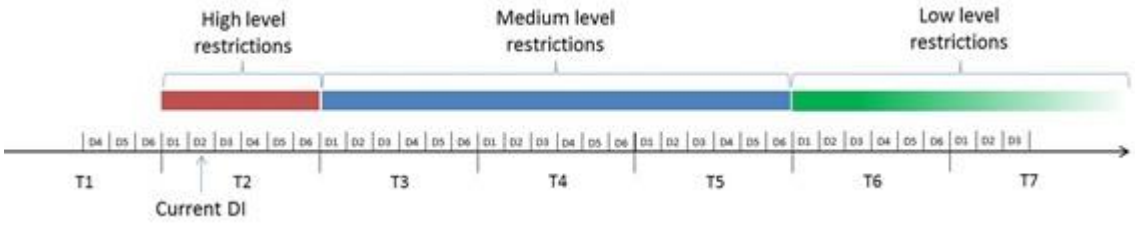
71 The timing limitations of AEMO's systems to incorporate rebids into the calculation of dispatch may result in variations to these times in practice.

dispatch intervals as considered appropriate. However, a drawback of a rolling window of time is that the restrictions do not always align with trading intervals upon which generator bids are based. For example, in option C in figure 5.1, a rebid made in D2 of T2 that applies to T3 would change the generator's offers for D3 to D6 of T3 but not for D1 and D2. This raises a number of questions around the ability of AEMO's systems to incorporate such restrictions into the rebidding process.

All of the options discussed above define a point in time beyond which it is assumed that the potential for inefficient outcomes arising from the rebidding activities of generators outweighs the potential market benefits. Such a binary approach is based on the assumption that rebids made before gate closure lead to efficient outcomes, while rebids made after gate closure lead to inefficient outcomes.

An alternative may be to impose a graduated gate closure which progressively increases the level of restrictions on rebids as the point of dispatch approaches. A graduated gate closure recognises that the potential for inefficient outcomes to arise increases progressively as time moves towards the point of dispatch. Figure 5.2 illustrates how such an approach might work in practice. The level of restrictions on rebids increases through stages, with the highest level of restrictions applied to rebids made within the current trading interval.

Figure 5.2 Graduated restrictions on rebidding



As the potential for inefficient market outcomes is more likely to arise closer to dispatch, there is potential for greater flexibility on rebidding to be applied with more time available. A graduated approach to gate closure would potentially allow for fewer restrictions on rebidding to be imposed early on than currently exists in the NEM, such as no longer requiring generators to provide a reason with every rebid made. Reporting requirements would then become progressively stricter closer to dispatch.

5.5.3 Balancing efficiency considerations in restricting rebids close to dispatch

As discussed previously, the introduction of a gate closure mechanism to the NEM would involve a compromise between two competing forms of market efficiencies. On one hand, it would limit the potential for price outcomes to be disproportionately influenced through late rebids that inhibit an efficient response from other participants while, on the other, it would restrict the flexibility for the market to reach efficient outcomes that reflect changing market conditions. The point at which this compromise is drawn depends on the level of restrictions that are placed on rebids and the window of time prior to dispatch to which these restrictions would apply.

With a gate closure, end users would be less exposed to high prices caused by late rebids towards the end of trading intervals for energy already consumed over the half hour. The prevention of late rebids might also mean that peaking generators would have time to start-up and generate to acquire market revenue, allowing them to meet their payment obligations under cap contracts. This could act to increase competition in the contract market, lowering prices to consumers and resulting in more efficient investment.

However, in designing a gate closure mechanism consideration must also be given to the potential impacts on individual participants from restricted rebidding. Rebidding is a tool that participants use to manage their risks of participating in the market. For example, rebidding may be used by a generator to manage an unplanned outage. If a unit trips and is offline, the generator may rebid its remaining capacity into lower price bands to dispatch greater output from its remaining units, and thus cover any contractual obligations.

In particular, rebidding can be used by generators to manage congestion-related dispatch risk. A generator constrained-off due to congestion may be unable to make a rebid in response to another generator's late rebid, which may have created a high price in pre-dispatch. Alternatively, a generator may anticipate being constrained-off due to congestion and may rebid to the market floor price prior to gate closure, only to find itself exposed to a negative market price.

Consequently, a market that prevents participants from adequately managing their risks may restrict efficient investment and undermine the long-term efficient operation of the market in the interests of consumers. The design of gate closure mechanism would therefore involve a consideration of the ability of different participants to manage their differing risks from participating in the market.

Finding an appropriate balance is particularly important in the NEM, as a result of its relatively high market price cap (MPC). CEG noted that the MPC is substantially lower in the majority of overseas jurisdictions surveyed. A low MPC can significantly reduce the incentives on generators to engage in late bidding behaviour, as well as reducing the impacts of any mechanisms that restrict the flexibility of participants. However, this comes at the expense of the efficient long-term operation of the market by blunting the signals for efficient investment, which the Commission considers to be of over-riding importance in the context of the NEM.[72]

72 The Competition Economists Group, *International review of rebidding activity and regulation*, December 2014, p. 5.

6 Lodging a submission

Submissions to this options paper are to be lodged online or by mail by 12 February 2015 in accordance with the following requirements.

Where practicable, submissions should be prepared in accordance with the Commission's Guidelines for making written submissions on rule change requests. The Commission publishes all submissions on its website, subject to a claim of confidentiality.

All enquiries on this project should be addressed to Sebastien Henry on (02) 8296 7800.

6.1 Lodging a submission electronically

Electronic submissions must be lodged online via the Commission's website, www.aemc.gov.au, using the "lodge a submission" function and selecting the project reference code "ERC0166". The submission must be on letterhead (if submitted on behalf of an organisation), signed and dated.

Upon receipt of the electronic submission, the Commission will issue a confirmation email. If this confirmation email is not received within 3 business days, it is the submitter's responsibility to ensure the submission has been delivered successfully.

6.2 Lodging a submission by mail

The submission must be on letterhead (if submitted on behalf of an organisation), signed and dated. The submission should be sent by mail to:

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Or by Fax to (02) 8296 7899

The envelope must be clearly marked with the project reference code: ERC0166.

Except in circumstances where the submission has been received electronically, upon receipt of the hardcopy submission the Commission will issue a confirmation letter.

If this confirmation letter is not received within 3 business days, it is the submitter's responsibility to ensure successful delivery of the submission has occurred.

Abbreviations

ACCC	Australian Competition and Consumer Commission
ACL	Australian Consumer Law
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CCA	Competition and Consumer Act 2010
CEG	The Competition Economists Group
Commission	See AEMC
DECC	Department of Energy and Climate Change (UK)
ERCOT	Electric Reliability Council of Texas
EUA	Electric Utilities Act 2003 (Alberta)
FERC	Federal Energy Regulatory Commission (US)
MPC	Market Price Cap
MSA	Market Surveillance Administrator (Alberta)
NECA	National Electricity Code Administrator
NEL	National Electricity Law
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NEO	National Electricity Objective
NER	National Electricity Rules
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency (European Union)
TPA	Trade Practices Act 1974
UTS	Undesirable Trading Situation (New Zealand)

A Background to the rule change request

This chapter sets out relevant background and provides context in which to assess the issues raised in the rule change request.

A.1 Rebidding in the NEM

Participation in the National Electricity Market (NEM) requires that generators submit bids to the Australian Energy Market Operator (AEMO) specifying the minimum price they are willing to receive for generation volume offered. Bids allow generators to specify a range of prices for different levels of generation output. Initial bids must be submitted to AEMO by 12:30pm for the following day and must set out the volume of generation offered in up to ten price bands for all 48 half-hour trading intervals.

Following the submission of initial bids, generators may shift volume between price bands through a process known as rebidding. Rebidding provides flexibility for generators to respond to shifting market conditions, such as changes in demand, plant availability, or network constraints, and provides a mechanism for the wholesale price of electricity to more accurately reflect the balance of supply and demand at the time of dispatch.

Rebidding can be undertaken at any time following the submission of the initial bid up until the relevant five-minute dispatch interval. The only timing constraint on the submission of rebids is a practical limitation of approximately three or four minutes for rebids to be incorporated in the NEM dispatch process and reflected in the dispatch merit order.

While the ability to make rebids until just before the time of dispatch means that the latest market conditions can be reflected in dispatch outcomes, it also reduces the certainty and predictability that participants have regarding expected price outcomes. This is particularly important for market participants that require a period of time to respond due to operational and technical limitations, such as peaking generators or large industrial loads wishing to curtail electricity consumption.

The ability for generators to make rebids means that forecasts of price outcomes prior to dispatch are almost certain to be different in some way to actual price outcomes. The earlier in time that price forecasts are made, the greater the interim period for generators to make rebids and therefore the more likely the eventual price outcomes will be different.

There is therefore a trade-off that exists with regard to the certainty and predictability of pre-dispatch forecasts and the flexibility of the market to respond to changing market conditions. As such, the rules governing rebidding represent a compromise that aims to achieve the most efficient market outcomes in the interests of consumers.

A.2 History of the rebidding rules

The rules for rebidding were authorised by the ACCC as part of the original authorisation of the National Electricity Code 1997.[73] At the time of authorisation, it was noted that the ability of the wholesale arrangements to deliver benefits was dependent on two features – the industry structure established in participating jurisdictions and the design and implementation of the National Electricity Code. It was considered that these two features would have important implications for the development of effective wholesale competition in the NEM and consequently for the public benefits stemming from reforms.

While recognising that the Code arrangements had the potential to result in greater efficiencies and lower costs to consumers, the ACCC also recognised that there were features of the Code that could act to offset the anticipated public benefits. One of these features was the provisions in the Code that allowed generators to submit rebids to make changes to their offered volumes after their initial bids had been submitted. At the time, the ACCC recognised that allowing rebidding was likely to result in efficiency benefits but that it might also be used to manipulate spot price outcomes.

Both NECA and the ACCC were of the view that rebidding in response to physical conditions, including forced outages, is essential to the operation of the market, and also that rebidding for non-physical reasons, including to reflect participants' dynamic contractual positions and in response to rebids made by other participants, is also important for the efficient and effective operation of the market.

However, it was also noted that the design of the rebidding provisions permitted generator bidding behaviour that may give rise to inefficient market outcomes. The ACCC specifically noted that rebidding up until the time of dispatch creates a situation whereby generators are able to "manipulate spot prices in a time frame within which market customers and some other generators cannot respond". The ACCC noted that while such activity may not contravene the TPA, it could significantly detract from the potential public benefits of the market arrangements.

In the draft determination for the original authorisation, the ACCC proposed to impose a prohibition on all rebidding within three trading intervals prior to dispatch.[74] These restrictions were based on concerns that the rebidding rules would provide generators with a number of avenues through which to game the market, and could therefore contribute to anti-competitive market outcomes.

Ultimately, the ACCC decided against imposing restrictions on rebidding, arguing that this may introduce distortions in the market and impose additional costs on market participants. Instead, the ACCC emphasised the importance of market monitoring and introduced a requirement for NECA to prepare a report every three months to identify and review all instances where actual prices that eventuated in the spot market were

73 ACCC, *Applications for authorisation – National Electricity Code*, 10 December 1997.

74 ACCC, *Amendments to the National Electricity Code – Changes to bidding and rebidding rules*, 4 December 2002, p. 5.

significantly different from prices that had been forecast. At the time of its determination, the ACCC suggested that the information accumulated by the market monitoring would drive possible market reforms into the future, and where anti-competitive behaviour is apparent the Commission would act to get the market design or arrangements altered to prohibit such behaviour.

In support of NECA's market monitoring role, the ACCC determined in 2000 to require participants to provide reasons for any rebid made and allow for these reasons to be published by NEMMCO.[75] The determination required that market participants provide, at the same time as a rebid is made:

- a brief, verifiable and specific reason for the rebid; and
- the time at which the event(s) or other occurrence(s) adduced by the market participant as the reason for the rebid occurred.

The ACCC considered that information regarding the underlying reasons for rebidding may be a valuable tool in the market analysis of bidding behaviour and would be likely to enhance NECA's market monitoring role. The ACCC also considered that the effectiveness of market monitoring and information gathering would be greatest where there is the greatest degree of transparency, and that transparency would increase the accountability of market participants.

A.3 The good faith provisions

The good faith bidding provisions were incorporated into the National Electricity Code in 2002 by the ACCC.[76] The changes were made to the Code following the submission of applications by the NECA under Part VII of the TPA.[77]

NECA's application to insert the good faith provisions followed expressions from NEM Ministers that they opposed generator bidding strategies that were inconsistent with an efficient, competitive and reliable market, such as those not made in good faith, the "blatant" economic withdrawal of generation, and the gaming of technical constraints.[78]

The changes introduced clause 3.8.22A to the NER which provides that all market participants must make rebids in good faith. A rebid is taken to be made in good faith if, at the time of making the rebid, the market participant has a genuine intention to

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75 ACCC, *Applications for authorisation – Amendments to the National Electricity Code (rebidding, VoLL scaling and settlements statements)*, 6 December 2000, pp. 5-9.

76 The ACCC's responsibility for authorising changes to the Code reflects earlier regulatory arrangements in the NEM. The provisions contained in the Code were transferred to the NER at its inception in July 2005. The AEMC has responsibility for administering and determining changes to the NER.

77 ACCC, *Amendments to the National Electricity Code – Changes to bidding and rebidding rules*, 4 December 2002.

78 The acting South Australian Minister for Energy noted this in a letter to the ACCC dated 6 September 2002, www.registers.accc.gov.au.

honour that rebid if the material conditions and circumstances upon which the rebid was based remain unchanged until the relevant dispatch interval.[79] A breach of clause 3.8.22A attracts a maximum civil penalty of $1 million.

NECA's application to the ACCC for authorisation to change the Code was based on its view that the changes would:[80]

- improve the reliability of pre-dispatch forecast prices in each dispatch interval, which would assist generators to plan the operation of their plant; and
- address aspects of generator's bidding and rebidding strategies that were of concern, and that were claimed to have been the cause of short-term price spikes experienced in the NEM.

Specifically, NECA proposed that the changes to the Code would alleviate:

- instances where rebids were made too close to the relevant dispatch interval for a competitive demand-side response, in particular where rebids were made in response to information or events about which the relevant parties had significant prior knowledge; and
- instances where rebids led to significant price volatility in response to relatively small changes in demand.

In authorising changes to the Code, the ACCC noted that restrictions on the ability to rebid, or the imposition of incentives not to rebid, could lead to less efficient outcomes and potentially higher prices, as compliance costs were recouped through generators' bids. Restrictions could result in less competitive price outcomes leading to inefficient dispatch of generation. However, the ACCC noted that the good faith bidding proposal did not constitute a restriction on rebidding as it only required that generators' bids must be honoured should all circumstances remain unchanged and did not limit or restrict generators' bidding strategies.

A.4 The Federal Court case - AER v Stanwell

The first and only judicial consideration of the obligation on a generator to make bids or rebids in good faith in the NEM was the decision of Justice Dowsett in the Federal Court in *Australian Energy Regulator v Stanwell Corporation Limited*.[81] The Court dismissed the AER's application that Stanwell had breached clause 3.8.22A of the NER.

The AER alleged that on 22 and 23 February 2008, traders at Stanwell made a number of rebids that were not made in good faith. The AER claimed that the rebids were not made in good faith because, in each case, they were made with the intention that if the

79 The good faith bidding provisions were initially incorporated in the Code and were transferred at the inception of the NER in July 2005.

80 ACCC, *Amendments to the National Electricity Code – Changes to bidding and rebidding rules*, 4 December 2002, p. 1.

81 *Australian Energy Regulator v Stanwell Corporation Limited* [2011] FCA 991, 30 August 2011.

dispatch price did not rise sufficiently as a result of the rebid, Stanwell would make a further rebid for the relevant trading interval. In the AER's view, the rebids were not accompanied by an intention that they would be honoured absent a change in material conditions and circumstances.

The AER argued that the reference to material conditions and circumstances in clause 3.8.22A(b) of the NER meant that a rebid is not made in good faith if it is based on objective conditions and circumstances for which there is not a material change. The AER noted that over the period of two days, there were eight separate rebids made by traders at Stanwell that did not result in a material change in dispatch price and that subsequent rebids for the same trading interval demonstrated that the original bids were not made in good faith.

In arriving at his decision, Justice Dowsett noted that all relevant conditions and circumstances upon which a rebid is based should be taken into account rather than focusing on individual elements. His Honour found that a trader's subjective expectations could be part of the material conditions and circumstances upon which a rebid could be based. As such, the non-fulfilment of the trader's subjective expectation could be considered as lawful justification for another rebid.

Justice Dowsett accepted the position put forward by Stanwell that a rebid could be considered to be made in good faith if it reflected the trader's intentions of what they were prepared to dispatch at the time of making the rebid. The Court noted that the fact that a trader had in his or her mind the possibility of making a further rebid, if their expectations were not met, did not make the initial bid one which was not made in good faith, and that a subsequent rebid for the same trading interval did not automatically infer that the trader did not intend to honour the first rebid.

Ultimately, his Honour found that in order to establish a breach of the good faith provisions the AER had to demonstrate that a trader did not have a genuine intention that a rebid be honoured for the dispatch intervals to which it related, at the time that it was made, absent a change in material conditions and circumstances.

B Quantitative statistical analysis of rebidding activity in the NEM – methodology adopted by ROAM Consulting

The analysis undertaken by ROAM Consulting was divided into two stages including a descriptive statistical analysis of rebidding in the NEM and an identification of statistically significant relationships between generator bidding behaviour and market parameters such as spot prices and demand.

The analysis covered the period between 1 January 2007 and 1 August 2014. This period was chosen so as to be long enough to capture the period prior to the recent decline in demand and growth in supply.

In stage 1, ROAM processed all of the bidding data submitted by generators since the beginning of 2007 to develop descriptive statistics which illustrated:

- the frequency of rebidding by each generating unit on a yearly, monthly and time of day basis;
- the frequency with which rebids were submitted that represent a movement of capacity to higher or lower price bands;
- the timing of rebids with respect to the 5-minute dispatch intervals to which the bid applied; and
- the frequency with which bids were submitted for dispatch intervals during the 30-minute trading interval.

In stage 2, the data collected in stage 1 was used to examine the potential for statistically significant relationships between observations as to the nature of rebidding and other factors such as regional demand, spot prices, etc.

Stage 1

In addition to identifying the volume and frequency of rebids, classifications based on timing and direction were also used to assess the nature of rebids. This involved categorising rebids into:

1. the time a rebid occurred relative to the dispatch interval that it was applied to; and
2. the volume of capacity offered at low/high price bands.

Rebids were examined that were submitted less than 60, 30 and 10 minutes before the start of the dispatch interval. Rebids were also examined that represented the first time that the bid was applied for the relevant dispatch interval.

In order to determine whether a rebid represented a movement to higher or lower price bands, an approach of testing whether additional volume was offered at prices above or below a threshold level of $300/MWh was applied. The primary benefit of

this approach is that it was relatively simple to implement and to interpret with more sophisticated approaches found to have implementation issues.

Results of the stage 1 analysis were based on aggregation of rebids including:

- A yearly analysis which averaged rebidding outcomes over each calendar year of the study period. This was primarily used to illustrate how rebidding activity across regions has changed over time.
- A monthly analysis which provided a more detailed assessment of movements in rebidding patterns over time and illustrated seasonality.
- A dispatch interval in trading interval analysis that presented bidding statistics for the six dispatch intervals within any trading interval. This data was primarily used to illustrate changes in the frequency or type of rebidding that occurs during the trading interval.
- A dispatch interval analysis showing the average rebidding statistics in each of the 288 dispatch intervals of the day in each calendar year. This data was primarily used to assess time of day trends and to look at patterns of bidding behaviour within single trading intervals.

Stage 2

The purpose of the stage 2 analysis was to analyse the potential relationships that may exist between bidding behaviour and market variables such as demand, pre-dispatch forecasts, pool prices, etc.

The relationships examined are summarised as follows:

- The relationship between the type of rebidding and the dispatch interval within the trading interval.
- The impact of market variables such as regional demand and import headroom on bidding behaviour.
- The relationship between bidding behaviour and the incidence of high regional pool prices.
- Determining the effect of generator forced outages and binding transmission constraint equations on bidding behaviour through case studies.
- The potential for pre-dispatch forecast outcomes to influence bidding behaviour over a short period.

For all relationships, the effect of the frequency and type of 'all rebids' and 'late rebids' were examined.