

Pricing in Pivotal Supplier Situations

A WAG Discussion Paper

27 May 2013

Note: This paper has been prepared by the WAG for the purpose of seeking stakeholder views on the issues canvassed in this paper.

No content in this the paper should be interpreted as representing the views or policy of the Electricity Authority.

Executive summary

This paper has been prepared by the WAG in response to the Authority's request for advice on measures:

"To improve confidence in the efficiency of prices when competitive pressures in the wholesale market are weak, thereby contributing to the Authority's statutory objective by improving wholesale and retail market competition."¹

This paper focuses mainly on 'local' pivotal supplier² situations as this type of event triggered the Authority's request for advice. However, the WAG has given some consideration to pivotal supplier situations that affect wider areas (such as an island or the entire country), as these situations may have a bearing on the scope of any recommended changes.³

The WAG has assessed the performance of current arrangements against the Authority's statutory objective, and particularly the effect of pivotal supplier situations on economic efficiency. Based on this assessment, the WAG has not identified any specific efficiency losses from recent local pivotal supplier situations⁴ – but this is not entirely surprising as they are still fresh and effects may not yet have become apparent.

Nor has the WAG's review identified any clear evidence of efficiency losses arising from wider pivotal supplier situations. However, it has not specifically examined whether or not spot prices reflect a competitive benchmark on average and it is aware of analysis by other parties that may raise questions in this area.⁵

More generally, the WAG notes that offer behaviour can evolve rapidly, meaning that history may not provide a reliable guide to the future. For this

¹ Correspondence - letter to WAG Chair, 22 June 2012, WAG work plan: <http://www.ea.govt.nz/our-work/advisory-working-groups/wag/5Jul12/>.

² A supplier is *pivotal* when the sum of all other suppliers' capacities (including imports via transmission links) is less than the total demand in that region for the relevant trading periods.

³ For example, any Code change which targeted pivotal supplier situations per se might have wider effects, even if it were primarily motivated by concern about local pivotal supplier situations.

⁴ It is understood that at least one retailer has informed the Authority that it is not seeking customers in some regions due to increased concerns about exposure to high prices when suppliers are pivotal. This type of action can lead to efficiency losses through weaker competition. See also the discussion in paragraph B.2.4 of Appendix B.

⁵ See paragraphs B.5.1 to B.5.6 in Appendix B

reason, the WAG has considered the *potential* for efficiency losses to arise in the future, based on the frequency of pivotal supplier situations that can be expected for underlying physical reasons, the plausible bounds for pivotal supplier actions, and the possible counter responses this could elicit from purchasers and end-consumers. This analysis indicates credible potential for material efficiency losses to arise from pivotal supplier situations in some scenarios – particularly in relation to dynamic efficiency effects.

In light of this finding, the WAG has identified and considered seven high level options to address concerns around pivotal supplier situations. These options are:

1. Introduce conduct provisions into the Code
2. Make a declaration when single generators are expected to be net pivotal and apply earlier gate closure to their offers
3. Improve incentives on the grid owner to mitigate pivotal supplier risk via changes to the outage protocol
4. Make the grid owner accountable for increased spot market costs during outages
5. Apply a general cap on offers or spot prices in all trading periods
6. Apply a temporary capping mechanism on pivotal supplier offers or affected spot prices in a region when there is a pivotal supplier⁶
7. Enforce a contract offer obligation where a supplier is expected to become pivotal.

These high level options have been assessed in terms of whether they will improve confidence in pricing outcomes in pivotal supplier situations, and their expected effect on investor confidence in last resort plant or demand response capability. The WAG has also considered their potential to create unintended adverse impacts, and their expected implementation costs and timeframes.

Modifying the outage protocol (Option 3) is expected to yield some incremental benefits and should be relatively easy to implement. However, the WAG does not consider that this option by itself would fundamentally alter performance relative to the status quo.

⁶ As noted earlier, pivotal supplier issues can arise in the markets for energy and/or reserve. For this reason, if a cap were to be used, this could be applied to energy or reserve offers, or both.

The introduction of conduct provisions into the Code (Option 1) has greater potential benefits than modifying the outage protocol, and could be implemented fairly swiftly assuming provisions are based broadly on those in the NZEM or MARIA (or on similar overseas rules). The WAG believes that this option warrants more detailed consideration.

Among the remaining options, the mechanism that offers the greatest potential to improve consumer confidence is the introduction of a temporary capping mechanism on offers by pivotal suppliers or prices in affected regions (Option 6). However, this option is assessed as being likely to reduce confidence for investment in last resort generation or demand response resources.

This option is also expected to require more time and effort to implement and carries greater risk of unintended adverse outcomes than Options 1 or 3. On the other hand, the introduction of a temporary capping mechanism has the greatest direct potential to improve consumer confidence in pricing outcomes in pivotal supplier situations, if that objective was the over-riding concern.

A further point to note is that provided conduct provisions operate as intended, they should have similar effects to a temporary capping mechanism because suppliers should be less likely to increase their offer prices solely to take advantage of a temporary thinning of competition. Furthermore, if a supplier did take such action, it would be likely to prompt an alleged breach of the conduct provisions and possible remedies.

Based on its analysis, the WAG considers that the Authority should investigate introducing conduct provisions into the Code and modifying the outage protocol. The WAG suggests that a temporary capping mechanism should be regarded as the preferred 'fall back' option at this point. This means it could be progressed if conduct provisions and modifications to the outage protocol proved to be insufficient, or if new information emerges to place priority on improving consumer confidence in pricing outcomes ahead of other objectives (such as a significant change in offer behaviour by pivotal generators).

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The Wholesale Advisory Group (WAG)

The members of the WAG, as at the date of the publication of this paper, are:

John Hancock (Chair)
Neal Barclay
John Carnegie
Graeme Everett
Stephen Peterson
Bruce Rogers
Richard Spearman
John Woods

Authority request

The Electricity Authority (Authority) has requested input and advice of the Wholesale Advisory Group (WAG) in considering issues associated with pivotal supplier situations. The WAG has produced this discussion paper exploring the efficiency issues that could arise from pivotal supplier situations, the extent to which pivotal supplier situations are occurring under current arrangements, and possible options for addressing pivotal supplier situations.

1 Introduction

1.1 Purpose of this paper

- 1.1.1 In recent times, some generators have offered and set spot prices at high levels when they have been in a pivotal position. High prices are essential when they reflect genuine supply shortages but are of questionable value if they are caused by suppliers exploiting situations where competitive pressure is weak. The key issue with high prices during pivotal supplier situations is that they can undermine confidence in pricing outcomes – and cause efficiency losses as parties take actions to reduce their exposure to pivotal supplier risk.
- 1.1.2 The Authority has requested the input and advice of the Wholesale Advisory Group (WAG) in considering issues associated with pivotal supplier situations. The Authority's objective in requesting the WAG to consider these issues is "to improve confidence in the efficiency of prices when competitive pressures in the wholesale market are weak, thereby contributing to the Authority's statutory objective by improving wholesale and retail market competition".⁷
- 1.1.3 More specifically, the Authority has indicated that for an option to be effective, it should provide:
- a) Consumers with more confidence about the efficiency of prices during pivotal supplier situations, and also
 - b) Investors with more confidence to charge prices they need to get a return on their last resort plant.⁸
- 1.1.4 The WAG has produced this discussion paper exploring the efficiency issues that could arise from pivotal supplier situations, the extent to which these are occurring under current arrangements, and possible options for addressing pivotal supplier situations.

1.2 Submissions

- 1.2.1 This discussion paper is published by the WAG, and the WAG will be responsible for considering submissions received.

⁷ Correspondence - letter to WAG Chair, 22 June 2012, WAG work plan: <http://www.ea.govt.nz/our-work/advisory-working-groups/wag/5Jul12/>

⁸ Letter to WAG Chair dated 12 April 2013 providing comment on WAG draft discussion paper titled *Improving pricing efficiency when a generator is pivotal*

- 1.2.2 The preference is to receive submissions in electronic format (Microsoft Word). It is not necessary to send hard copies of submissions to the WAG, unless it is not possible to do so electronically. Submissions in electronic form should be emailed to wag@ea.govt.nz with “Pricing in a Pivotal Supplier Situation” in the subject line.
- 1.2.3 If submitters do not wish to send their submission electronically, they should post one hard copy of their submission to one of the addresses below.
- | | | |
|---------------------------|----|--------------------------|
| Submissions | or | Submissions |
| WAG Chair | | WAG Chair |
| c/- Electricity Authority | | c/-Electricity Authority |
| PO Box 10041 | | Level 7, ASB Bank Tower |
| Wellington 6143 | | 2 Hunter Street |
| | | Wellington |
- Tel: 0-4-460 8860
Fax: 0-4-460 8879
- 1.2.4 Submissions should be received by 5.00 pm on 9 July 2013. Please note that late submissions are unlikely to be considered.
- 1.2.5 The Authority, on behalf of the WAG, will acknowledge receipt of all submissions electronically. Please contact the Submissions Administrator at the Authority if you do not receive electronic acknowledgement of your submission within two business days.
- 1.2.6 If possible, submissions should include responses to the questions the WAG has included in the Discussion Paper. The full list of questions is given in Appendix A.
- 1.2.7 Your submission is likely to be made available to the general public on the Authority’s website. Submitters should indicate any documents attached, in support of the submission, in a covering letter, and clearly indicate any information that is provided to the WAG on a confidential basis. However, all information provided to the WAG is subject to the Official Information Act 1982.

1.3 Next steps

- 1.3.1 The WAG will consider all submissions on this discussion document and publish a summary of submissions, including a response to the points raised. Depending on the points made in submissions, the WAG may develop the

proposal through a further discussion paper or make high level recommendations to the Board for the Authority to develop the proposal further.

2 Outcomes in pivotal supplier situations may cause efficiency losses

2.1 A pivotal supplier can determine the spot price in the affected region

- 2.1.1 A supplier is pivotal in a region when the sum of all other suppliers' capacities (including imports via transmission links) is less than the total demand (including reserve requirements) in that region for the relevant trading periods. As a result, the pivotal supplier must offer some part of its generation if all planned demand is to be served and normal reserve levels are to be maintained. For this reason, a pivotal supplier has the *ability* to determine the spot price for energy and/or reserve in the affected region during the relevant trading periods and is said to have transient market power.
- 2.1.2 A pivotal supplier's *incentive* to raise (or lower) the local spot price may be affected by its net exposure in the relevant region. A net pivotal supplier is a party that is required to generate to avoid unserved load and whose generation is greater than its own retail and hedge sales in the relevant area. For this reason, a party that is *gross* pivotal may not have an incentive to raise spot prices if this would result in its generation being less than its retail and hedge sales.
- 2.1.3 That said, unless such retail and hedge sales have fixed prices and relatively long terms, suppliers may still prefer higher spot prices in pivotal situations as these will presumably support higher contract prices in the future. For this reason, the threat of demand response or new generation entry may be more important constraints on pricing by pivotal suppliers.

2.2 Authority's statutory objective and Code amendment principles

- 2.2.1 The Authority's statutory objective is "to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers".⁹
- 2.2.2 The Authority has published guidance on how it interprets this objective.¹⁰ In relation to "benefit to consumers", the Authority stated that:

⁹ Section 15 of the Electricity Industry Act 2010.

¹⁰ Interpretation of the Authority's statutory objective, 14 February 2011

“in virtually all circumstances, only the efficiency gains of an initiative should be treated as benefiting consumers, with wealth transfers excluded because they ‘net off’ among all electricity consumers once indirect wealth effects are taken into account”.

- 2.2.3 However, the Authority has stated that it will take account of wealth transfers where these give rise to efficiency effects. For example, it stated that:

“if wealth transfers seriously undermine confidence in the pricing process or in the electricity industry more generally then that can inhibit efficient entry and investment decisions and these dynamic efficiency effects should be taken into account when evaluating proposals”.

- 2.2.4 As discussed below, pivotal supplier situations could give rise to significant wealth transfers, and accordingly dynamic efficiency effects may be relevant in this context.

2.3 Outcomes in pivotal supplier situations may cause efficiency losses

- 2.3.1 It is important to recognise that the presence of high spot prices when a supplier is pivotal does not necessarily indicate inefficiency. Indeed, in situations of genuine shortage, all suppliers are technically pivotal, and spot prices should be at high levels to signal the cost of involuntary demand curtailment or reduced reserve coverage. Further, if spot prices do not properly reflect the cost to customers of reduced security, then this will have adverse effects on the incentives to provide voluntary demand response and last resort plant needed to ensure adequate reliability.
- 2.3.2 Inefficiency will only arise if spot prices in an area subject to pivotal supply diverge from the marginal value of electricity or reserve at that time and location – i.e. the value that would be established in a workably competitive market. Clearly, it may be difficult to establish this value in pivotal supplier events. One yardstick is the value immediately before and after the pivotal supply periods (as reflected in offer prices for different tranches of ‘local’ supply).
- 2.3.3 However, these values may not be appropriate if the pivotal supplier event itself leads to some change in underlying economic conditions. For example, in some situations a pivotal supplier may be called upon to maintain local

frequency keeping, and the operating and capital costs of this service may only be recoverable during pivotal supplier periods.

- 2.3.4 These types of consideration mean that it may not be straightforward to determine whether high prices in a pivotal supplier situation are efficient. One approach is to consider a scenario where the pivotal supplier was notionally a number of separate competing entities. If the spot price outcomes observed in practice were broadly similar to those expected under this scenario, there are unlikely to be particular efficiency concerns. Conversely, if observed spot prices were materially higher than would be expected under a scenario of notional competing suppliers (and assuming the suppliers recover their reasonable costs), this would suggest that reduced competition was an important contributor to price outcomes. That would then raise the issue of whether higher prices were leading to efficiency losses.

Productive efficiency losses

- 2.3.5 A productively efficient allocation of resources ensures society is getting the most outputs from the volume of inputs available to it. This involves choosing the most efficient production method, and using it in the way that minimises waste.
- 2.3.6 At the wholesale level, productive losses could arise if parties invested in, or utilised, more expensive generation, network or demand-side response options as a way to avoid exposure to high spot prices during pivotal supplier situations. Such losses could occur in response to actual instances of pivotal supplier pricing, or pre-emptively in anticipation of potential high prices in pivotal supplier situations.
- 2.3.7 In either case, the magnitude of the efficiency loss would depend on:
- a) the level of substitution toward less efficient production options – which in turn is affected by the extent to which prices are expected to increase in pivotal supplier situations, the volume of load affected and the expected frequency of occurrence; and
 - b) the relative cost difference between the efficient and less efficient production (or demand-side) options.
- 2.3.8 Productive efficiency losses could also potentially occur via a weakening of competitive pressures. For example, if concern about exposure to pivotal

suppliers resulted in a narrowing of retail coverage by parties, this could lead in turn to an increase in retail operating costs.

Allocative efficiency

- 2.3.9 Allocative efficiency refers to whether resources are employed for the best use from society's perspective. Prices in the electricity market provide signals which affect choices by consumers and producers. If prices were to be distorted by pivotal supplier behaviour, this could have a flow-on impact on consumption and production decisions.¹¹
- 2.3.10 In particular, if prices are too high in pivotal supplier situations, this will tend to reduce electricity demand and production, relative to the optimal level.

Dynamic efficiency

- 2.3.11 Dynamic efficiency refers to the process of innovation and investment, allowing the economy over time to produce a higher volume and/quality of the goods and services demanded by society. Dynamic inefficiency arises where the process of making and deploying innovations and investment is hindered in some way.
- 2.3.12 One of the most important drivers for dynamic efficiency is the level of competition. There is a risk that increased incidence of high prices from pivotal supplier behaviour could reduce competition. In particular, the New Zealand electricity market is characterised by a significant degree of vertical and horizontal integration. This means that parties that are buyers at one time can be pivotal suppliers at other times. Parties with such dual interests may be in a better negotiating position with other pivotal suppliers (e.g. when purchasing hedge products) because of the potential for mutually beneficial trades.
- 2.3.13 Conversely, smaller suppliers without any potential to be pivotal may have greater difficulty in managing spot price risk and buying hedge cover on acceptable terms. To the extent these effects occur, it could inhibit entry or expansion by smaller or non-integrated suppliers and reduce competitive tension in the generation, hedge and retail markets.

¹¹ The distinction between productive and allocative efficiency can be illustrated by considering a situation where (say) horseshoe production is achieved with minimum use of steel and energy (productive efficiency), but at production levels that far exceed consumer demand (allocative inefficiency).

- 2.3.14 Another factor that can affect investment (and hence dynamic efficiency) is the perception of risk within a market. If parties perceive that there is potential for sizeable and unpredictable value transfers for reasons other than changes in underlying supply and demand, this is likely to retard investment and innovation. This risk will increase if market arrangements are perceived to be ineffective at critical times, or if there is a heightened likelihood of ad hoc policy intervention during periods of market stress.
- 2.3.15 Accordingly, even though value transfers may not cause productive or allocative efficiency losses, they can cause dynamic efficiency losses by reducing confidence in the electricity market and generally retarding investment and innovation.
- 2.3.16 Measuring dynamic efficiency losses is typically harder than measuring productive or allocative losses because they are less directly observable. However, dynamic efficiency is almost universally regarded as being the most important form of efficiency, because dynamic efficiency effects are cumulative and will often promote other forms of efficiency further down the track.

3 Extent of problems with current arrangements

3.1 Local pivotal supplier situations

- 3.1.1 Local pivotal supplier situations arising from transmission outages are not new. For example, the Waikaremoana stations were pivotal in the East Cape region during transmission outages over a number of weekends in 2000. During these outages, spot prices in the region were approximately \$800/MWh higher than prices elsewhere. Similarly, Waikato river hydro plant was pivotal in the Bay of Plenty/East Cape region during a series of transmission outages in 2003. At times, spot prices in the affected areas were approximately \$700-1,000/MWh higher than adjacent regions not subject to transmission constraints.
- 3.1.2 Although local pivotal supplier situations have occurred in the past, recent events have attracted increased scrutiny for two key reasons:
- a) **Significant increase in energy offer by local pivotal supplier relative to earlier years** - In February 2012 planned transmission outages led to Tekapo A becoming pivotal at times in the South Canterbury area.¹²

¹² Affecting the Albury and Tekapo A nodes.

During trading periods that Tekapo A was pivotal, its energy offer was \$3,000/MWh compared to \$0.01/MWh for preceding and following trading periods.¹³ When Tekapo A was pivotal, spot prices at the affected nodes were almost \$3,000/MWh higher than at Benmore. By comparison, the highest spot price differential observed in past transmission outages in the area was less than \$500/MWh;¹⁴ and

- b) **Potential ripple effect** – On 5 April 2012 a planned transformer outage at Stoke made the Cobb power station pivotal between 08:00 and 17:00 in the Motueka area.¹⁵ During these hours 12 MW of energy was moved from offer price bands of less than \$100/MWh to \$3,000/MWh,¹⁶ compared to the offer price structure for trading periods immediately before and after the transformer outage. During the outage, spot prices in the affected area cleared at \$3,000/MWh or higher. The Authority noted that the Cobb station is pivotal for around 30 hours each year, and in all previous Stoke transformer outages the maximum price differential with Benmore was \$261.60/MWh.¹⁷ The higher generation offers at Cobb emerged around six weeks after the Tekapo A station was pivotal and offered its output at \$3,000/MWh (the same value as subsequently offered at Cobb). In this context, the Authority noted that “studying the historical offers at these two locations reveals a change of offer behaviour of the net pivotal generator in an isolated region.”¹⁸

- 3.1.3 In terms of specific impacts, no efficiency losses have been identified that can be directly attributed to these events.¹⁹ However, this is not surprising as any losses would be difficult to observe or calculate and the situations are

¹³ This is based on the first 8MW of capacity which would be needed to meet local demand. See the Authority Market Performance Review, 30 July 2012 for more detail (available at: <http://www.ea.govt.nz/industry/monitoring/enquiries-reviews-investigations/2012/>)

¹⁴ Comparing prices at Tekapo A for the first 8MW of capacity needed to meet local demand in transmission outages between May 2004 and April 2012.

¹⁵ Affecting the Cobb, Motueka and Motupipi nodes.

¹⁶ Some energy continued to be offered in the less than \$100/MWh band, but this was less than demand in the area.

¹⁷ The differential is measured at Cobb and covers the period between May 2004 to April 2012

¹⁸ See the Authority Market Performance Review, 30 July 2012.

¹⁹ It is understood that at least one retailer has informed the Authority that it is not seeking customers in some regions due to increased concerns about exposure to high prices when suppliers are pivotal. This type of action can lead to efficiency losses through weaker competition. See also the discussion in paragraph B.2.4 of Appendix B.

still fairly recent so the effects would be expected to emerge over time. More generally, offer prices in some recent pivotal supplier situations have been much higher than in the past, and it is not clear whether the upward movement will continue, recede, or stabilise. For this reason, history may not provide a reliable guide to the future and it is important to consider the *potential* efficiency losses that could arise during pivotal supplier situations. This involves consideration of:

- a) the likely frequency of pivotal supplier situations
- b) the price outcomes that could occur in these events and the volume of demand that could plausibly be affected
- c) the types and sizes of efficiency losses that could arise.

3.1.4 In carrying out analysis on the potential for efficiency losses, the WAG has focussed largely on local pivotal supply situations, as this was the type of event that triggered the Authority's original request for advice. However, the WAG notes that pivotal supplier situations need not be confined to a local area. For this reason it has also undertaken analysis of pivotal supplier events affecting a wider area, such as an island or the entire country. Considering both types of event will assist in determining the potential for issues to arise under current arrangements and the nature of any recommended changes.

3.2 Potential efficiency losses from local pivotal supplier events

- 3.2.1 Analysis in section B.2 of Appendix B indicates that more than 200 MW of load is expected to be exposed to a local pivotal supplier for at least 30 hours per year (mainly due to periodic transmission outages).
- 3.2.2 Some affected purchasers may be able to mitigate this risk exposure by purchasing suitable hedge contracts, such as risk swaps discussed in paragraph 2.3.12. However, some purchasers are likely to be unable to obtain hedge cover from the pivotal supplier on acceptable terms, and instead would need to take other steps to mitigate their purchase risk, such as procuring and using back-up generation, curtailing load, or (for retailers) reducing their service coverage. Each of these can give rise to efficiency losses.
- 3.2.3 In practice, the most likely response to the exercise of market power by a local pivotal supplier would be a thinning of competition in retail and hedge markets in affected areas. This would occur because wholesale

intermediaries (retailers and hedge sellers) other than the pivotal supplier would be less willing to take on purchase risk in the affected area. This would be expected to weaken incentives to control retail operating costs (a productive efficiency loss) and this has been estimated at \$0.5 - \$5 million in present value terms.

- 3.2.4 Although they are less likely, other productive efficiency effects could arise. At the extreme, a local pivotal supplier could in principle raise local average spot prices (and hence retail and contract prices) to reflect the cost of the next best alternative from the point of view of local end-users, since these parties cannot readily leave the area (unlike retailers). In this case, productive efficiency losses would be likely to arise if inefficient investment occurred in back-up generation to mitigate price risk in pivotal supply situations.²⁰
- 3.2.5 As set out in paragraphs B.2.9 to B.2.15, an upper bound on the potential productive efficiency loss has been estimated by considering the volume of inefficient generation investment that could occur, and the incremental investment cost of such generation. This yields an estimated upper bound of \$24 million in present value terms for productive efficiency losses.
- 3.2.6 As set out in paragraphs B.2.16 to B.2.25, a rise in local prices would also be expected to create inefficient demand reduction (an allocative efficiency loss). This has been estimated at \$0.1 - \$0.4 million in present value terms.
- 3.2.7 Finally, local events might also give rise to dynamic efficiency effects. The load directly exposed to local pivotal suppliers is a relatively small proportion of total demand. For this reason, dynamic efficiency effects are not expected to be material in their own right from local pivotal supply situations.
- 3.2.8 However, as discussed later, there are occasions when a much larger proportion of demand is subject to the actions of a pivotal supplier. Although those events are expected to occur less frequently, the emergence of high prices in those situations (absent an underlying physical reason) would be much more likely to lead to dynamic efficiency effects because of the scale of the issue and number of affected parties.

²⁰ Back-up generation is likely to be less costly than other alternatives such as increased transmission capacity. However, increased demand response may be viable in some situations, but will not be the most economic option where the pivotal supplier meets all load. Note that no loss would occur if the *threat* of investment in back-up generation or demand response etc. was sufficient to cause the pivotal generator to reduce its offer price to just below the cost of the next best alternative.

3.2.9 In that respect, the treatment of local pivotal supplier situations could have more importance than its direct impact would suggest, because it may be viewed as a 'marker' by participants of how regulatory authorities would respond (or not) to a much wider pivotal supplier situation.

3.3 Potential efficiency losses from wider pivotal supplier events

- 3.3.1 It appears that wider (national or island-level) pivotal supplier events have often occurred in the past. These events have occurred in both the energy and reserve markets. The WAG is not aware of any clear evidence that suppliers have taken advantage of such situations to set the spot price to inefficiently high levels. This observation is based on analysis set out in Appendix B, which compares spot price outcomes in periods when a supplier was estimated to have been net pivotal and other 'non-pivotal supplier' periods.
- 3.3.2 However, it has not specifically examined whether or not spot prices reflect a competitive benchmark on average and is aware of analysis by other parties that may raise questions in this area.²¹
- 3.3.3 Returning to transitory pivotal supplier events, unless parties can arrange hedge cover, the most likely responses to heightened price risk are an increase in the supply margin (to carry more buffer against pivotal supplier risk), and/or to undertake inefficiently high levels of demand curtailment (only possible if high price events can be forecast reliably).
- 3.3.4 As set out in section B.4 of Appendix B, the potential aggregate productive efficiency losses from these effects are estimated at up to \$90 million in present value terms.
- 3.3.5 Productive efficiency losses may also arise in the retail sector due to:
- a) parties reducing their retail operations in islands where they have limited or no ability to self-insure with generation or undertake risk swaps
 - b) parties reducing or limiting their retail operations more generally because of perceived price risk.
- 3.3.6 As set out in paragraphs B.4.5 to B.4.6, the potential efficiency loss from this effect is estimated at up to \$10-20 million in present value terms, although this is not expected to be additive with other productive efficiency effects noted above. In addition, increased prices would be expected to lead to

²¹ See paragraphs B.5.1 to B.5.6 in Appendix B

inefficient demand reduction (allocative efficiency loss), which is estimated at between \$1-7 million in present value terms.

- 3.3.7 Finally, exposure to pivotal supplier risk would be expected to give rise to dynamic efficiency effects. The load directly exposed to such risk is sizeable, and there is potential for significant value transfers if spot prices are high. To the extent that high prices reflect underlying market conditions, this should not be a concern. However, there is potential for prices to be very high absent any underlying physical reason, and this could reduce confidence in the market and lead to dynamic efficiency losses. As set out in paragraphs B.4.23 to B.4.25, this potential effect has been estimated at \$60 million to \$120 million in present value terms.

3.4 Overall observations in relation to efficiency effects

- 3.4.1 The WAG has not identified any specific efficiency losses arising from recent local or wider pivotal supplier situations. However, this is not surprising as the effects are difficult to observe and measure and the situations still fairly recent. More generally, offer prices in some recent local pivotal supplier situations have been much higher than in the past, and it is not clear whether the upward movement will continue, recede, or stabilise. Because offer behaviour can change rapidly history may not provide a reliable guide to the future.
- 3.4.2 For this reason, it is important to consider the potential for efficiency losses to arise, based on the underlying frequency of pivotal supplier situations, the plausible bounds for pivotal supplier action, and the likely counter responses this would elicit from purchasers and end-consumers. Table 1 summarises the results of this analysis.

Table 1 Potential efficiency losses²²

	Localised situations	Wider area situations
Productive efficiency effects	\$1 - \$24 million	\$10 - \$90 million
Allocative efficiency effects	\$0.1 - \$0.4 million	\$1 - \$7 million

²² Note the figures are not necessarily additive. The derivation of these figures is set out in Appendix B.

	Localised situations	Wider area situations
Dynamic efficiency effects	Unlikely to be significant in own right – but potential to act as ‘marker’ for wider events	\$60 - \$120 million

- 3.4.3 The analysis indicates a potential for moderate efficiency losses to arise from local pivotal supplier situations. These are likely to occur mainly through a thinning of retail and hedge market competition in affected localities, but could reach the upper estimates if inefficient investment in back-up generation or demand response resources were to occur. This appears less likely, and the higher estimates should therefore be regarded as an upper bound for local pivotal supplier situations.
- 3.4.4 In respect of pivotal supplier situations affecting wider areas, the magnitude of potential efficiency losses is greater. In particular, there is potential for significant dynamic efficiency losses to arise if pivotal supplier risk were to become a barrier to entry and expansion.
- 3.4.5 In light of this finding, the WAG considers that options should be explored to reduce the risk of efficiency losses from pivotal supplier situations. However, given that any action would be precautionary in nature, the WAG considers that options should only be further advanced if the risk of unintended consequences is relatively low.

Q1. Do you agree with the assessment of the potential efficiency losses of pivotal supplier situations for both localised situations and wider area situations? If not, why not?

4 High level options considered to address pivotal supplier situations

- 4.1.1 This section outlines the options the WAG has considered for addressing concerns identified in relation to pivotal supplier situations. It begins by commenting on the effectiveness of existing key mechanisms (the Commerce Act and the Undesirable Trading Situation (UTS) provisions of the Code) for addressing these concerns.

4.1 Commerce Act

- 4.1.1 The Commerce Act contains a number of provisions to promote competition, and might therefore be expected to affect pivotal supplier situations. However, the Commerce Act is unlikely to apply to a pivotal supplier situation unless it involves the *coordinated action* of two or more parties, or a pivotal supplier is acting with a clear anti-competitive *purpose* beyond simply raising prices. For these reasons, the Commerce Act is unlikely to be effective in addressing most pivotal supplier situations.²³

4.2 Undesirable Trading Situation provisions

- 4.2.1 Part 5 of the Code sets out the actions that the Authority can take to correct a UTS if it finds that such a situation is developing or has developed. In brief, these powers include:
- a) suspending, limiting or curtailing, an activity on the wholesale market
 - b) deferring completion of trades for a specified period
 - c) directing that any trades be closed out or settled at a specified price
 - d) giving directions to a participant to act in a manner not inconsistent with the law.
- 4.2.2 In principle, the UTS provisions might be used to address concerns about pivotal supplier situations. However, there are some difficulties with this approach. First, there is a relatively high threshold for triggering the UTS provisions. In particular, the Authority needs to be satisfied that trading on the wholesale market is threatened or may be threatened (among other requirements). It is not clear whether a localised pivotal supplier situation would meet this test, even though it might give rise to substantive efficiency concerns. Second, the effects of individual events on efficiency may be cumulative, whereas the UTS test is event specific.
- 4.2.3 A more targeted approach is preferred because it should provide participants with greater certainty. Furthermore, addressing pivotal supplier situations more directly in the Code should reduce the scope of the UTS provisions. This observation is based on the fact that the UTS provisions can only be invoked if the contingency or event “in the reasonable opinion of the Authority, cannot satisfactorily be resolved by any other mechanism

²³ See Appendix C for more information in relation to the Commerce Act.

available under this Code”.²⁴ The WAG notes that, while the Authority is reviewing the UTS provisions and recently published a consultation paper proposing a number of amendments, no change is proposed in relation to the clause (b) of the UTS definition and therefore the UTS provisions will remain as reserve powers under the Code.

4.3 Overview of possible options

4.3.1 In light of the factors discussed above, the WAG has considered seven high level alternatives to the status quo to address issues with local pivotal supplier situations. These options are:

- 1) Introduce conduct provisions into the Code
- 2) Make a declaration when single generators are expected to be net pivotal and apply earlier gate closure to their offers
- 3) Improve incentives on the grid owner to mitigate pivotal supplier risk via changes to outage protocol
- 4) Make the grid owner accountable for increased spot market costs during outages
- 5) Apply a general cap on offers or prices in all trading periods
- 6) Apply a temporary capping mechanism on pivotal supplier offers or affected prices in a region when there is a pivotal supplier
- 7) Enforce a contract offer obligation where a supplier is expected to become pivotal.

Q2. Are there any other high level options for addressing issues with local pivotal supplier situations that should be considered? If so, what are they?

4.4 Status quo

4.4.1 Before considering alternatives, it is important to consider the status quo given that it includes some pro-competitive measures that are in train but have yet to take effect (e.g. the introduction of FTRs and dispatchable demand). The key advantage of this option is that it should have a low risk of creating unintended consequences. Furthermore, reliance on pro-competitive measures (where these are in the pipeline) can help to directly address pivotal supplier concerns.

²⁴ Clause (b) of the definition of a UTS in Part 1, Electricity Industry Participation Code 2010

- 4.4.2 That being said, the pro-competitive measures that are in train are expected to be most effective at addressing concerns about wider pivotal supplier situations (e.g. an island or national level situation) and would not completely address that risk. For this reason, the status quo is not seen as sufficient if there are other options available that have low implementation risk and cost, and which could reduce concerns about pivotal supplier situations.

Q3. Do you agree with the assessment that the status quo is not sufficient if there are other options available that have low implementation risk and cost, and that could reduce efficiency concerns about pivotal supplier situations? If not, why not?

4.5 Option 1 - Introduce conduct provisions

- 4.5.1 Conduct provisions are rules that require participants to either act in a specified way or to not act in a specified way. Conduct provisions are fairly common in market arrangements, and some conduct provisions were included in the New Zealand Electricity Market (NZEM) Rules that applied from 1996 to 2003 and in the Metering and Reconciliation Information Agreement (MARIA) Rules that permitted bilateral trading of wholesale electricity until 2003.
- 4.5.2 Conduct provisions were not carried forward into the Electricity Governance Rules (EGRs) when these superseded the NZEM and MARIA rules in 2003. Subsequently, when the Code was introduced in 2010, it was largely based on the EGRs meaning that it too does not place any general conduct obligations on participants.
- 4.5.3 No document has been identified that sets out the reasons for not carrying forward the NZEM or MARIA conduct provisions into the EGRs. However, discussions with some of the individuals involved at the time suggest that it may have been based partly on the fact that the conduct provisions were in the 'governance' chapters of the NZEM and MARIA rules. These chapters focused largely on the procedures for making rule changes, but this was not relevant in the EGRs as rule change procedures were set out in the empowering legislation. There may also have been a view that conduct provisions were unnecessary in a set of rules that were backed by statute.
- 4.5.4 As discussed below, there is no inherent reason to exclude broad conduct provisions from market arrangements that have a statutory basis. Indeed,

such provisions are common in financial and electricity markets set up under statute. For example, the NZX Participant Rules contain extensive conduct provisions and exist under a statutory framework.²⁵ Similarly, Australia's National Electricity Market (NEM) arrangements contain conduct provisions that are defined in the National Electricity Rules (NER), which in turn are overseen by a statutory body.

Range of potential of conduct provisions

4.5.5 Table 2 summarises a range of conduct provisions from other markets. These provisions fall into four broad categories:

- a) prohibitions on fraudulent or deceitful behaviour;
- b) prohibitions on market manipulation;
- c) prohibitions on abuse of a dominant position; and
- d) positive requirements to act in good faith or observe high standards of conduct.

Table 2 Conduct provisions in other markets

Type of rule		Example(s)
A	Prohibition on fraudulent activity	• Code of Federal Regulations (CFR)(USA) in relation to electric energy.
	Prohibition on deceitful acts	• Code of Federal Regulations (CFR)(USA) in relation to electric energy.
B	Prohibition on market manipulation	• Regulation on wholesale energy market integrity and transparency (REMIT) in Europe; • Nord Pool Spot Market Conduct Rules; and • NZX Participant Rules.
C	Prohibition on abusing dominant position	• Singapore Electricity Act.
D	Requirements to observe	• NZX Participant Rules.

²⁵ The rules for the NZX must be approved by the Financial Markets Authority under the Securities Markets Act 1988.

Type of rule		Example(s)
	ethical standards	
	Requirement to act in good faith	• Australian National Electricity Rules.
	Requirement to observe: • good business conduct; or • good (or high standards of) trading conduct; or • good broking practice.	• NZEM Rules (“high standards of trading conduct”); • MARIA Rules (“maintain high standards of integrity and fair dealing”) • NZX Rules (“good broking practice”); and • Nord Pool Spot Market Conduct Rules (“good business conduct”).

Source: Various. More detail on the conduct provisions is provided in Appendix D.

Prohibition on fraudulent or deceitful behaviour;

- 4.5.6 Provisions that rule out fraudulent or deceitful conduct are relatively clear cut, and essentially rule out actions that are designed to deliberately mislead. Clause 13.2 of the Code provides that participants must not disclose information that is misleading or deceptive. While this would not cover actions that do not involve information disclosure (such as misleading conduct), such behaviour could attract prosecution under the Crimes Act.²⁶ It could also attract prosecution under the Fair Trading Act, the principal provision of which reads “No person shall, in trade, engage in conduct that is misleading or deceptive or is likely to mislead or deceive”.²⁷ Other provisions of that Act prohibit misleading and deceptive conduct, and false and misleading representations.
- 4.5.7 Finally, a Code prohibition would not address concerns about pivotal supplier situations as these do not generally arise from any misleading or deceitful

²⁶ Section 240 of the Crimes Act makes it an offence to obtain any benefit or valuable consideration by deception. Deception is defined to be (a) a false representation, whether oral, documentary, or by conduct, where the person making the representation intends to deceive any other person and: (i) knows that it is false in a material particular; or (ii) is reckless as to whether it is false in a material particular; or (b) an omission to disclose a material particular, with intent to deceive any person, in circumstances where there is a duty to disclose it; or (c) a fraudulent device, trick, or stratagem used with intent to deceive any person

²⁷ Section 10 of Fair Trading Act 1986.

behaviour. Accordingly, the WAG does not see particular merit in adding new provisions of this type to the Code.

Prohibition on market manipulation

- 4.5.8 A number of markets have rules that prohibit market manipulation. For example, the US Federal Energy Regulatory Commission (FERC) prohibits “actions or transactions that are without a legitimate business purpose and that are intended to or foreseeably could manipulate market prices ...”.²⁸ To clarify the meaning of “legitimate business purpose”, the FERC used the following example “if the behaviour was undertaken to provide service to a buyer with rates, terms and conditions disciplined by the competitive forces of the market, we would find the transaction to have a legitimate business purpose. Since the underlying purpose of an action is not always obvious and conclusions regarding the intent of others are often a matter of judgment, we found that we would base our enforcement of this rule on a careful consideration of the facts and circumstances of the conduct at issue, recognizing that intent must often be inferred therefrom.”²⁹
- 4.5.9 The EU REMIT also contains a prohibition against market manipulation. It states: “Any engagement in, or attempt to engage in, market manipulation on wholesale energy markets shall be prohibited.”³⁰ Article 2(2) of REMIT distinguishes four categories of manipulation: false or misleading transactions, price positioning, the use of fictitious devices or deception, and the dissemination of false and misleading information.³¹ REMIT also provides examples of market manipulation, such as “manipulation on wholesale energy markets involves actions undertaken by persons that artificially cause prices to be at a level not justified by market forces of supply and demand, including actual availability of production, storage or transportation capacity, and demand.”³²
- 4.5.10 A prohibition against market manipulation could be effective at addressing pivotal supplier situations. For example, this could test whether a party is engaging in ‘manipulation’ to create an ‘artificial’ price. The WAG notes that

²⁸ Market Behavior Rules Order, 105 FERC

²⁹ Ibid.

³⁰ Article 5 REMIT.

³¹ Agency for Cooperation of Energy Regulators (ACER) guidance 3.2.

³² Article 13 REMIT

the application of such a test may not be entirely straightforward. In particular, it could require assessments to be made about the underlying intent of a participant's behaviour. As discussed in Appendix C, it can be difficult to discern and prove the intent of parties.

- 4.5.11 Furthermore, it may be difficult to draw a line between market manipulation and conduct which may be commercially aggressive, but which falls short of market manipulation. For example, a party may be pivotal during an emergency (when other supply has unexpectedly failed) and offer its generation at a higher price because it now perceives a higher future opportunity cost for its output. In such circumstances, it may be difficult to determine whether the behaviour fell into the prohibited area, especially as high spot prices might be expected in an emergency. This uncertainty might undermine incentives to invest in and utilise voluntary demand response capability and/or last resort generation.
- 4.5.12 On the other hand, the same broad issues were raised in the context of the FERC and REMIT anti-manipulation rules, but regulatory authorities concluded that there would be net benefits in adopting the provisions.
- 4.5.13 The WAG also notes that the NZEM Rules contained an anti-manipulation provision where this threatened or potentially threatened the market. More specifically, the NZEM Rules conferred broad powers on the Market Surveillance Committee (MSC) to remedy an "Undesirable Situation", which was defined as "any situation that threatens, or may threaten fair, orderly or proper trading on the NZEM".^{33,34} Without affecting the generality of the foregoing, the Rules noted that a possible cause of an undesirable situation was "manipulative or attempted manipulative activity".³⁵ Thus, although the NZEM Rules contained no specific conduct provision relating to market manipulation, there was a de facto protection within the undesirable situation provisions.
- 4.5.14 Taking all of these factors into account, the WAG sees merit in adding a conduct provision to the Code that would prohibit market manipulation activity.

³³ Rule 2.36 in Part 1 of NZEM Rules [check final NZEM rule numbering]

³⁴ The current Code contains a similar provision in the definition of "Undesirable Trading Situation" in Part 1.

³⁵ A number of other possible causes were also set out in the Rules.

Prohibition on market abuse

- 4.5.15 Some electricity markets have adopted prohibitions against ‘market abuse’ or ‘abuse of a dominant position’. At a generic level, these provisions raise similar issues to the prohibitions against ‘market manipulation’ discussed in the previous section. Indeed, the terms do not appear to have any clearly accepted definitions, and may blur at the boundaries.
- 4.5.16 However, it appears more common for markets to frame their conduct provisions in relation to specific prohibitions, i.e. to rule out market manipulation, insider trading, deceptive conduct – all of which may be considered to be forms of ‘market abuse’ in the wider sense.
- 4.5.17 Only one electricity market has been identified that has a specific provision against ‘abuse of a dominant position’. The Singapore Electricity Act prohibits “any conduct on the part of one or more persons which amounts to the abuse of a dominant position in any wholesale electricity market or the retail electricity market in Singapore”, and further states that conduct may constitute abuse if it consists of:
- a. “directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions of electricity in Singapore
 - b. limiting generation of electricity, on any wholesale electricity market, the retail electricity market or technical development in the electricity industry in Singapore to the prejudice of consumers
 - c. applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage or
 - d. making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.”³⁶
- 4.5.18 A number of other markets have considered broad anti-abuse provisions, but have not adopted them to date³⁷. For example the United Kingdom’s Office of Gas and Electricity Markets (Ofgem) sought to introduce a “Market Abuse License Condition” in 1999. The proposed condition was challenged by two

³⁶ Section 51 of the Singapore Electricity Act

³⁷ At least not on an on-going basis.

generators, and the matter was referred to the UK Competition Commission. In 2000, the Commission upheld the appeals and annulled the condition, noting that, among other things, Ofgem's definition of market abuse was so broad as to "cause uncertainty, because of the difficulty of distinguishing between abusive and acceptable conduct, and would risk deterring normal competitive behaviour".³⁸

- 4.5.19 More recently, the UK regulatory authorities have proposed a transitional licence condition to address concerns about market power until forthcoming transmission upgrades have occurred. These conditions appear to have come into force in late 2012, and are scheduled to expire in July 2017 (but can be extended by up to two years).³⁹ More generally, the UK arrangements will be aligned with the REMIT provisions as they come into force (noting that these contain prohibitions against market manipulation).
- 4.5.20 Within the Australian National Electricity Market (NEM), the Major Energy Users Inc. requested a rule change in late 2010 to address concerns it held about the exercise of market power by generators.⁴⁰ The proposed rule change would have restricted the offers of generators deemed to have market power to the administered price cap (A\$300/MWh at the time).
- 4.5.21 In a draft determination in mid-2012, the AEMC declined to adopt the rule change because it considered there was insufficient evidence of the existence of substantial market power to warrant such a rule change. It also stated that "any rule that seeks to constrain or limit the bidding of generators, in the manner proposed by the MEU, or a similar manner, is likely to diminish incentives in the current investment environment."⁴¹ A number of parties (including the Australian Energy Regulator) have contested aspects of the AEMC's draft findings. In its final determination, the

³⁸ UK Competition Commission, AES and British Energy: A report on references made under section 12 of the Electricity Act 1989, App. 2.1 (2001).

³⁹ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42861/5771-government-response-to-the-transmission-constraint.pdf

⁴⁰ Proposed rule change to enhance generator competition outcomes during high demand periods in the NEM", 15 November 2010, available at <http://www.aemc.gov.au/Media/docs/Rule%20change%20request-9e1e0dae-fcb2-4c2f-bd98-d7351de60840-0.pdf>.

⁴¹ <http://www.aemc.gov.au/Electricity/Rule-changes/Open/potential-generator-market-power-in-the-nem.html>

AEMC declined to proceed with the rule change proposed by the MEU, and instead recommended that energy ministers consider conferring on the Australian Energy Regulator a specific function to regularly report on whether the wholesale electricity market is operating efficiently.⁴²

- 4.5.22 Overall, it appears that a prohibition against market abuse or abuse of a dominant position could assist in addressing concerns about pivotal supplier situations. However, as far as can be ascertained, only one electricity market has adopted a provision of this type as a permanent measure.
- 4.5.23 In light of the limited international experience and the absence of such provisions within the NZEM or the MARIA rules, the WAG does not propose the adoption of a market abuse provision at this time. Instead, the WAG suggests that other conduct provisions (including a prohibition against market manipulation) be adopted. If these prove to be insufficient to address specific concerns or behaviours, then the adoption of other provisions, such as anti-market abuse provisions, might be reconsidered. That would also allow for any further international experience to be evaluated, particularly as the issue is currently a 'live matter' in the NEM.

Positive requirement to act in good faith or observe high standards of conduct

- 4.5.24 The final broad conduct category seen in other markets is a positive obligation to act in accordance with high standards of conduct or similar provisions. Although these would also have some uncertainty associated with their interpretation, they should avoid the need for a regulatory body to make any determination about parties' intent. Nor is it likely to require the development of extensive arrangements to gather information and monitor behaviour. Instead, where these provisions exist in other markets, they are generally invoked on a case by case basis because a party brings an allegation of breach against a participant.
- 4.5.25 In this context, the WAG notes that the NZEM Rules contained 'good conduct' provisions that were not carried through to the successor Electricity Governance Rules (EGRs) (or the Code). While these were worded in a fairly broad manner, a number of parties familiar with that period have suggested

⁴² See <http://www.aemc.gov.au/electricity/rule-changes/completed/potential-generator-market-power-in-the-nem.html>

that they provided a check on offer behaviour during pivotal supply situations. These parties state that the check operated via two mechanisms:

- a) Direct impact – the presence of a conduct provision created a downside risk for a pivotal supplier if it set its offer prices at ‘too high’ a level. This downside risk took the form of potentially having to defend the offer price before the Market Surveillance Committee (MSC) if a rule breach was alleged. This meant the supplier could attract significant external scrutiny, face the cost of mounting a defence, and ultimately could be sanctioned if a breach was upheld. In effect, parties needed to be confident of being able to externally justify their offer price if required. This position is contrasted with the current Code where there is no conduct provision. It is argued that this creates a ‘free option’ for pivotal suppliers which they can use without needing to be concerned about the prospect of external review.⁴³
- b) Indirect impact – alleged or actual breaches of market rules by a company were often required by internal policies to be promptly reported to the company’s board. This was (and still is) especially true for larger companies, who were also the parties most likely to be pivotal at times. This meant that the personnel determining offer prices needed to be confident they could defend their actions to senior management, who in turn needed to be able to justify their actions to the board. In essence, this meant that there was quite a high degree of internal scrutiny of offer prices, and the process for changing offer prices.

4.5.26 While the WAG is not able to fully test these views given the passage of time, they are consistent with the recollections of a number of individuals involved in the NZEM.

4.5.27 In making these observations, the WAG is not suggesting that all market outcomes under the NZEM were ideal or uncontroversial. Rather, the key point is that the absence of any conduct provision in the Code could be perceived as creating a free option for a pivotal supplier. The inclusion of conduct provisions could help to redress this balance, and judging by the NZEM experience, appears to have relatively low risk of unintended adverse consequences.

⁴³ Other than the provisions of the Commerce Act, and the undesirable trading situation provisions of the Code.

NZEM conduct rules as an example

4.5.28 The NZEM Rules included the following provisions:

- a) market participants and service providers must “observe high standards of trading conduct”⁴⁴
- b) the MSC was responsible for investigating “all allegations of misconduct, or suspected breaches of these rules”⁴⁵
- c) the MSC had the power to terminate or suspend a market participant’s trading rights if the market participant was “guilty of misconduct in carrying on its business”.⁴⁶

4.5.29 Furthermore, as noted earlier, the NZEM Rules specifically noted that a possible cause of an “Undesirable Situation” was “manipulative or attempted manipulative activity”.^{47,48} Thus, there was a de facto anti-manipulation rule which could be applied if a situation was sufficiently severe.

4.5.30 In addition, the NZEM rules required that any offer made by a generator had to be a reasonable estimate of its ability to generate at each given price band. Specifically, the rules required that each offer:

“In relation to the generation plant that is the subject of the offer, not exceed, for each price band, the Generator Class Market Participant’s reasonable estimate of the quantity of Electricity capable of being supplied at that grid injection point by that generation plant given the price in that band.”⁴⁹

4.5.31 A similar rule exists in the Code, but does not make any reference to price:

“Each **offer** submitted by a **generator** must in relation to the **generating plant** that is the subject of the **offer**, not exceed, for each **trading period**, the **generator’s** reasonable estimate of the quantity of **electricity** capable of being supplied at that **grid**

⁴⁴ NZEM Rules, rule 1.6.3, Part 1.

⁴⁵ NZEM Rules, rule 2.4.6, Part 1.

⁴⁶ NZEM Rules June 2002, rule 2.23.3, Part 1 (or rule 2.22.3, Part 1 in some earlier versions of the rules).

⁴⁷ See paragraph 4.5.13

⁴⁸ NZEM Rules June 2002, rule 2.35

⁴⁹ NZEM Rules, rule 2.64, Part 2, Section B.

injection point by the relevant **generating plant** for the relevant **trading period**⁵⁰

- 4.5.32 According to some (but by no means all) parties that were trading at the time, the NZEM provisions could deter generators from raising their offer prices solely to take advantage of pivotal supplier situations. Traders of parties with this view had to be able to explain to their management and Board (and potentially the MSC) what had caused the trader to increase the price of generating a quantity of electricity at a power station, if it was possible to do so at a much lower price in the previous or subsequent trading periods. Parties that subscribed to this view felt that price increases in line with changes in costs were likely to be compliant with the requirement while opportunistic pricing from a temporary thinning of competition was not.
- 4.5.33 A provision along the NZEM lines could be added to the Code. It might be worded such that there would be no scrutiny of changes in the price of a tranche of generation unrelated to costs provided changes were made well in advance of conditions where it might set the price. A change in price should be made in enough time for parties affected to identify and make adjustments to their trading positions in response to any new price risks in the area.

Enforcement of conduct provisions

- 4.5.34 If conduct provisions were added to the Code, alleged breaches would be processed according to provisions of the Electricity Industry Act. This makes the Authority responsible for compliance monitoring and the initial investigation of alleged breaches. If the Authority considers that a Code breach has occurred, it can refer the case to the Rulings Panel for a determination. The Rulings Panel can take one or more of nine actions set out in the Act to address a breach.⁵¹ These actions include:
- a) issuing a warning or reprimand to the participant
 - b) ordering the participant to pay a penalty to the Crown of up to \$200,000
 - c) ordering the participant to pay compensation to another person
 - d) requiring the participant to take any action necessary to restore it to a position of compliance with the Code

⁵⁰ Clause 13.9(b) of the Code.

⁵¹ Section 54 of the Act.

e) recommending to the Authority that a change should be made to the Code or regulations.

4.5.35 The rights to determine compensation payments and penalties (upon application by the Authority) mean that the Rulings Panel would have effective remedies in the event that an alleged breach was upheld. However, these remedies differ to the remedies that were available to the MSC. For example, while the MSC had the ability to suspend or terminate a participant's trading rights, the Rulings Panel does not.

4.5.36 These factors suggest that it would be workable to introduce conduct provisions within the Code, and for them to operate in a broadly similar fashion to the provisions of the NZEM or MARIA Rules.

Certification of compliance

4.5.37 To reinforce the introduction of conduct provisions, participants could be required to provide an annual compliance statement to the Authority. This would require relevant participants' Boards to certify that they were satisfied that the steps taken by the participant were likely to result in its employees being aware of the conduct provisions. In terms of coverage, this requirement would apply to all participants submitting offers of any product (e.g. energy, reserve of any type, frequency keeping) to WITS, since these are the parties able to become pivotal suppliers at some time.

4.5.38 As noted in paragraph 4.5.25b), board oversight of conduct provisions can be an important factor in influencing compliance. For this reason, an annual compliance statement would require the signature of two directors, or a director and either the chief executive or chief financial officer (the same requirement as for stress testing).

Overall effectiveness

4.5.39 Conduct provisions could potentially assist in improving consumer confidence about the efficiency of prices during pivotal supplier situations, while avoiding an undermining effect on investment incentives for last resort plant.

4.5.40 However, much depends on the detail of any conduct provisions and how precisely these are framed. The more tightly these target the underlying economic principles, the more likely they are to be effective, and vice versa.

4.5.41 On the other hand, experience in other jurisdictions indicates that there will inherently be some degree of uncertainty about how conduct provisions will be interpreted in practice. Arguably, this uncertainty is increased where the final arbiter is likely to make relatively infrequent decisions and therefore has less opportunity to benefit from accumulated knowledge and expertise. This is likely to be the case in the current context, as final decision-making responsibility would fall to the Rulings Panel.⁵²

Q4. Do you consider that adding conduct provisions to the Code would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning and which type of conduct provisions do you advocate⁵³ and why? Is it likely to lead to any unintended consequences, and if so, what might these be?

4.6 Option 2 - Prior declaration of single pivotal generator situations

4.6.1 The rationale behind this mechanism is that if purchasers have earlier warning of pivotal supplier situations and the spot price they will face, this could help them to explore and adopt alternatives which may be cheaper and more efficient.

4.6.2 The broad elements of this mechanism would be:⁵⁴

- a) The Authority would assess forecast schedules to identify when any single generators are expected to be net pivotal as a result of a transmission outage. Where such generators are identified, the Authority would make a 'net pivotal supplier declaration'.
- b) Generators declared to be net pivotal would need to provide and 'lock-down' their offer prices and quantities for the affected plant earlier than normal (i.e. gate closure would be significantly before the standard two hours ahead of real time). Generators could only make offer adjustments

⁵² Absent any general legal rights to seek a review of the decision-making process.

⁵³ E.g. General requirements not to engage in market manipulation, specific requirement for generators to be able to justify late changes in offer prices, requirement to provide an annual compliance certificate, or another form.

⁵⁴ An option along these lines was discussed as an illustrative remedy in the Market Performance Report on Locally Net Pivotal Generation published by the Authority in 2012. See <http://www.ea.govt.nz/dmsdocument/13478>

if these reduced expected spot prices⁵⁵ or there was a bona fide physical reason to do so.

Identification of net pivotal generators

- 4.6.3 To identify whether a generator is expected to be net pivotal would involve two tests:
- a) Identifying whether a supplier will be required to operate in order for load to be met (i.e. whether it will be *gross* pivotal) for some portion of the grid
 - b) Identifying whether a supplier will have a short-term incentive to favour higher spot prices (i.e. whether it will be *net* pivotal) in that region.
- 4.6.4 In principle, the gross pivotal test could be fairly straightforward to apply when assessing the effect of transmission outages on single generators in 'simple' parts of the grid, such as outages that make generators at Cobb or Tekapo pivotal. However, it would be more difficult in parts of the grid where there are more sources of uncertainty, such as the presence of intermittent generation, greater demand variation, and multiple generators. For example, it may not have provided earlier warning of the expected presence of a pivotal generator (and possibly more than one) on 26 March 2011 because the event came about due to a confluence of factors.
- 4.6.5 Furthermore, even where the gross pivotal test is straightforward, testing for net pivotal status will be harder because it requires information about hedge contracts which could be difficult to obtain or assess (such as the effect of swaptions). For this reason, the mechanism would presumably need to allow for declarations to be rescinded where a party makes further information available to the Authority.
- 4.6.6 Another issue to consider is the frequency with which the test will be triggered. Analysis of data for 2009 to 2011 estimates that Meridian Energy (as a single generator) was net pivotal in the South Island in 39% of all trading periods (see section B.3 of Appendix B). However, as indicated in the Appendix, the results of this type of analysis are highly dependent on the assumptions employed to estimate contract position.⁵⁶

⁵⁵ No reduction in aggregate offer volume, or movement of volume to higher price bands would be permitted.

⁵⁶ The assumptions about Meridian Energy's electricity sales are likely to be conservative as exchange-traded products and bilaterally negotiated over-the-counter contracts were not factored into the

- 4.6.7 The WAG's analysis highlights the potential for net pivotal declarations to be relatively frequent and potentially misleading if they are based on analysis of public data. This may undermine the 'warning' value of the mechanism.

Gate closure timing

- 4.6.8 Ideally for purchasers, the notice and lock-down period should be long enough to arrange alternative generation or voluntary demand response. Assuming they can reasonably foresee the potential for high prices (which is at least true for local pivotal suppliers arising from planned transmission outages), they should be able to prepare contingent options ahead of time. This suggests the period only needs to cover the 'activation' time, e.g. to obtain and relocate a mobile back-up generator, or give notice in respect of voluntary demand response. In this context, a period of (say) up to one week should be sufficient to cover most cases.
- 4.6.9 On the other hand, the longer the period, the more likelihood there is that the mechanism will cause inflexibilities for generators that have a genuine need to reduce their offer quantities.
- 4.6.10 For example, generators facing complex commitment or river chain management decisions could need to make offer refinements relatively close to real time to address physical (rather than commercial) issues.
- 4.6.11 To address such needs, generators that expect to be declared net pivotal might shape their initial offers to preserve flexibility. For example, they might limit the quantity of offered generation at the outset to an amount that they are certain to be able to produce (which might be zero). They could then add further volume if needed (subject to the restrictions) as real time approaches.
- 4.6.12 Such responses may make forward schedules less reliable and lead to a greater incidence of infeasibilities in forecast prices. While it is difficult to assess the extent and magnitude of such effects at this point, there appears to be some potential for unintended consequences in this area.

analysis due to a lack of half-hourly contract data. Therefore, the results of the analysis almost certainly over-estimates the amount of time Meridian Energy is net pivotal, as gentailers are likely to be net sellers of these products.

Overall effectiveness

- 4.6.13 In principle, the proposed mechanism should improve consumer confidence in the efficiency of prices during pivotal supplier situations by providing earlier information about expected prices. This could provide consumers with more opportunity to pursue alternatives where they wish to do so. While these alternatives may not be inexpensive (e.g. diesel-fired generation), they may be less costly and provide more certainty than paying the spot price set by a pivotal supplier.
- 4.6.14 However, it is important to note that market participants currently receive at least six weeks' notice (and sometimes up to a year) of planned transmission outages.⁵⁷ Market participants can already use this information to identify periods when there is increased *potential* for high prices due to pivotal suppliers, and to make contingency plans. The principle potential information gain would therefore be in relation to the expected level of prices. However, it is not clear how much real improvement this would provide. As noted above, pivotal generators might respond to the mechanism by reducing their initial offer quantities to preserve subsequent flexibility. This could make forecast information less reliable.
- 4.6.15 Looking at the option from the perspective of potential investors in last resort resource, there should not be any direct dampening effect on incentives. However, it is likely to be perceived as an important enabling step to more intrusive options which could dampen incentives.
- 4.6.16 In light of these factors, the incremental gains from the mechanism may not outweigh the likely costs and risks.

Q5. Do you consider that the net pivotal declaration mechanism would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?

⁵⁷ Transpower is required to publish an annual Outage Plan that includes all reasonably foreseeable outages by 19 May each year, for the period beginning 1 July. Transpower may vary this plan, and must notify such changes.

4.7 Option 3 – Modify Outage Protocol

- 4.7.1 This option would involve amending the Outage Protocol to strengthen the incentives on the grid owner when planning transmission outages, to mitigate pivotal supplier situations if participants raise concerns about the Outage Plan.

Net benefit test could be amended to include competition effects

- 4.7.2 As noted earlier, most local pivotal supplier situations arise because of planned transmission outages. Transpower is required to include all reasonably foreseeable outages in its annual Outage Plan. Before the Outage Plan is published, Transpower must consult with interested participants on planned outages of the interconnection assets and provide an opportunity for each affected designated transmission customer to meet with Transpower on planned outages of the connection assets.
- 4.7.3 During this consultation period, an interested participant may notify Transpower if it believes that a proposed outage of interconnection assets may not meet the “net benefit principle”. These arrangements generally appear sensible as they place the onus on participants to identify outages that may cause adverse effects, and allow them to raise their concerns with Transpower. However, the test that Transpower is required to apply appears unduly restrictive.
- 4.7.4 The current test is framed around a net benefit principle as defined in the Code:

“The net benefit principle is that, in planning and varying a **planned outage**, Transpower must ensure that the **planned outage** is likely to result in net benefits to persons who produce, transmit, distribute, retail or consume **electricity**—

- (a) in respect of **interconnection assets**, to the extent those persons are affected by an outage; and
- (b) in respect of **connection assets**, if Transpower has not agreed the timing and duration of the **outage** with the relevant **designated transmission customer** in accordance with the

Outage Protocol, to the extent those persons are affected by an **outage**.”⁵⁸

- 4.7.5 If Transpower is notified by an interested participant that it believes a proposed outage may not meet the net benefit principle then Transpower must:
- a) decide whether it still wishes to proceed with the proposed outage; and if so
 - b) determine whether the outage is:
 - “reasonably expected to: ⁵⁹
 - (1) result in the power system failing to meet **grid reliability standards**; and/or
 - (2) give rise to **binding constraints**; and/or
 - (3) result in loss of supply to **consumers**”; and if so
 - c) undertake the “net benefit test”.
- 4.7.6 If the net benefit test is negative then Transpower cannot include the proposed outage in its outage plan.
- 4.7.7 When Transpower undertakes a net benefit test it must estimate the costs and benefits described in clauses A.6.1 and A.6.2 of Appendix A of the Outage Protocol. These costs and benefits are as follows:
- “A.6.1 Estimates of costs:
- (a) the direct labour and material costs that **Transpower** will incur when undertaking the outage;
 - (b) the direct labour and material costs that **designated transmission customers** will incur as a result of **Transpower** undertaking the outage;
 - (c) the extent of any increase in **expected unserved energy** arising from any increased risk that the **outage** may result in loss of **supply**;

⁵⁸ Clause 12.140(2) of the Code.

⁵⁹ Clause 3.3.4(b)(i) of the Outage Protocol.

- (d) any additional fuel costs incurred by any **generators** in respect of any generating unit that will, or will be likely, to be dispatched during or after the **outage** and as a result of the **outage**;
- (e) the extent of any increase in **expected unserved energy** arising from loss of **supply** during the **outage**;
- (f) any relevant matter specified in clauses 27.1 to 27.9 of schedule F4 of section III [*clause 12.43(1)(a)(iv) and (b)(iv) of the Code*], where the matter referred to in those clauses is a benefit to any person that produces, transmits, retails or consumes **electricity** in New Zealand; and
- (g) any other cost to any person that produces, transmits, retails or consumes **electricity** in New Zealand that **Transpower** reasonably considers to be relevant to the **outage**.

A.6.2 Estimates of benefits:

- (a) the extent of any reduction in the **expected unserved energy** arising from any reduction in the risk that future **outages** may result in loss of supply;
- (b) any reduction in maintenance costs, capital costs, refurbishment costs and operating costs resulting from the outage (including **Transpower's** and any **designated transmission customer's** costs);
- (c) any reduction in fuel costs incurred by any **generator** in respect of any generating unit, arising or likely to arise during or after the **outage** and as a result of the **outage**;
- (d) the extent of any decrease in **expected unserved energy** arising from the **outage**;
- (e) any relevant matter specified in clauses 27.1 to 27.9 of schedule F4 of section III [*clause 12.43(1)(a)(iv) and (b)(iv) of the Code*], where the matter referred to in those clauses is a cost to any person who produces, transmits, retails or consumes **electricity** in New Zealand; and

- (f) any other benefit to any person who produces, transmits, retails or consumes **electricity** in New Zealand that **Transpower** reasonably considers to be relevant to the **outage**.

4.7.8 The estimated costs and benefits must also include the costs and benefits in clauses 12.43(1)(a)(iv) and (b)(iv) of the Code respectively. These clauses indicate that the costs and benefits must include any of the following costs/benefits that is a cost/benefit:

“to a person who produces, transmits, retails, or consumes electricity in New Zealand:

- (A) changes in fuel costs of existing assets, committed projects and modelled projects:
- (B) changes in the value of involuntary **demand** curtailment:
- (C) changes in the costs of **demand**-side management:
- (D) changes in costs resulting from deferral of capital expenditure on **modelled projects**:
- (E) changes in costs resulting from differences in the amount of capital expenditure on **modelled projects**:
- (F) changes in costs resulting from differences in operations and maintenance expenditure on **existing assets, committed projects, and modelled projects**:
- (G) changes in costs for **ancillary services**:
- (H) changes in **losses**, including **local losses**:
- (I) subsidies or other benefits provided under or arising pursuant to all applicable laws, regulations and administrative determinations;”⁶⁰

4.7.9 Notably, the net benefit test does not require Transpower to take account of the impact of an outage on competition.

4.7.10 By contrast, in the Commerce Commission’s regime applying to Transpower’s capital costs (the CAPEX Input Methodology)⁶¹ competition effects are included:

⁶⁰ From clauses 12.43(1)(a)(iv) and (b)(iv) of the Code.

“Competition effects means value of the expected change in economic surplus due to a change in competition among participants in the electricity market as a result of a **major capex project** undertaken by **Transpower**, which must exclude any expected change in economic surplus due to a change in another **electricity market benefit or cost element** listed in clause D5(1).”⁶²

Examples of actions that could occur from amending the net benefit test

- 4.7.11 Because the current net benefit test excludes competition effects when considering requests to vary or avoid an outage, Transpower is effectively required to focus on productive and allocative efficiency effects, and must ignore wealth transfers that can lead to dynamic efficiency effects.
- 4.7.12 Inclusion of competition benefits could alter the outcome of the net benefit test, at times. Outcomes would likely be significantly different if the increased cost of power in an area caused by pivotal pricing was included as a consideration for Transpower in its outage planning decisions. For example, relatively high prices expected during an outage could create stronger incentives for Transpower:
- a) To undertake outages in lower demand periods, such as weekends or at night, if this reduces exposure to pivotal supplier risk. At present, the test would recognise any increased cost associated with maintenance work outside normal hours, but is very unlikely to identify any offsetting benefit.
 - b) To manage security trade-offs in a more flexible manner. The WAG understands that local pivotal supply situations can sometimes be alleviated by temporarily relaxing security (e.g. from N-1 to N security) in an affected area. The WAG understands that Transpower has agreed to such relaxations in the past, but only where *all* affected transmission customers agree. This creates a risk of holdout, especially if the pivotal supplier is one of the affected parties. It would be preferable for such trade-offs to be considered from a broader economic perspective. This appears feasible if competition effects are introduced into the net

⁶¹ <http://www.comcom.govt.nz/assets/Pan-Industry/Input-Methodologies/Transpower-Capital-Expenditure-IM/Capex-IM-Final-Determination-and-Reasons-Paper/Transpower-Capital-Expenditure-Input-Methodologies-Determination-2012.pdf>

⁶² Paragraph D6 of Transpower’s CAPEX Input Methodology.

benefit test, as Transpower could then consider the potential competition benefits from a temporary relaxation in security, whereas this does not appear feasible under the current test. This might also lead to a different practical test being applied, such as a specified majority of customers assenting to a temporary reduction in security.

- c) To consider other arrangements to mitigate pivotal supplier risk where these are available and require consent of Transpower. For example, the WAG understands that in the case of transmission line outages between Albury and Timaru, local demand can be met by the Tekapo A or Opuha power stations. However, past practice has been for Opuha station to be requested not to generate as part of the outage planning process. Under a modified net benefit test, parties could request Transpower to modify the Outage Plan to allow both generators to operate, or to choose the party with greatest competition benefits to be the pivotal supplier.⁶³

Overall effectiveness

- 4.7.13 In principle, strengthening the incentives on the grid owner to manage outages in a way that reduces costs in pivotal supplier situations is attractive. It should assist in increasing consumer confidence about the efficiency of prices in pivotal supplier situations.
- 4.7.14 It appears unlikely that this mechanism would undermine investor confidence in last resort plant, because it would not constrain the ability of prices to reach high levels when this is required for genuine reasons.

Q6. Do you consider that amending the Outage Protocol to include competition effects in the net benefit test would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning?

4.8 Option 4 - Make grid owner accountable for increased spot market costs during outages

- 4.8.1 As noted above, at times the grid owner already works closely with its customers to manage transmission outages to lower costs, for example by shifting outages or putting in temporary generation in some instances. In

⁶³ For more information on the Opuha and Tekapo A arrangements, see paragraphs 6.13 – 6.18 of *Local net pivotal generation – Market Performance Review*, Electricity Authority, 30 July 2012 (available at: <http://www.ea.govt.nz/industry/monitoring/enquiries-reviews-investigations/2012/>)

deciding whether to undertake such actions, the Outage Protocol requires the grid owner to pursue them where they will produce overall net benefits. However, the grid owner itself does not have any direct financial incentive in the outcome (other than the impact on its own costs).

- 4.8.2 In principle, the grid owner could be made financially accountable for any increased spot market costs caused by pivotal generators during outages. The rationale for this would be that the grid owner may have access to more options, or could be in a better position to coordinate across options (e.g. demand response, back-up generation) than other individual parties. If this is the case, it could improve the bargaining power with pivotal generators.
- 4.8.3 For the option to be effective, the extent of 'increased spot market costs' would need to be measurable, and Transpower would need clear incentives to minimise such costs (i.e. they could not simply be a 100% pass through).

Measuring extent of increased spot market costs

- 4.8.4 The clearest way to measure the extent of increased spot market costs arising from transmission (and potentially generation) outages would be to compute settlement amounts based on a notional full grid, and separately based on the grid with outages. This approach is feasible and is used in the Single Electricity Market (SEM) which covers the island of Ireland.
- 4.8.5 It is important to note that the difference will capture all of the increased costs associated with non-availability of grid, not just effects that arise from pivotal generators. For example, it would reflect costs from use of more expensive generation where these suppliers are non-pivotal. There is no clear and unambiguous way to isolate the impact of pivotal generators from other effects in an interconnected grid. If the isolation of pivotal supplier effects was seen as necessary, the methodology would probably need to be limited to smaller areas of the grid, i.e. only address the highly localised situations.
- 4.8.6 However, it is not clear that it would be desirable to isolate pivotal supplier effects in any case. The underlying notion behind this option is that Transpower should have an incentive to maintain grid availability in general, and that, to the extent that outages are required, they should be managed in a way that minimises costs to participants.

Incentives on Transpower to minimise increased spot market costs

- 4.8.7 Putting the measurement issue to one side, it would be necessary to create incentives for Transpower to minimise the extent of increased spot market costs (whether it is part of a broader regime to incentivise grid availability or focussed on localised pivotal supplier issues).
- 4.8.8 In particular, the issue comes down to who pays the difference between settlement costs computed with and without the effect of outages/pivotal suppliers for the trading period. This difference is effectively a form of constrained-on cost.⁶⁴
- 4.8.9 To establish an incentive on Transpower to minimise this cost, it must face at least some portion of the total cost. Equally, to the extent that it succeeds in reducing the expected level of cost, it should be rewarded for doing so.
- 4.8.10 Transpower is currently subject to revenue control under the Commerce Act, and the regime is overseen by the Commerce Commission. To introduce an incentive-based mechanism relating to grid availability (whether narrow or broad in scope) would be expected to require substantial modification to this regime. The design issues are non-trivial, and the changes might also require legislative amendments.
- 4.8.11 Putting these high level issues to one side, there would also be some significant implementation issues. In particular, calculating the revenue allowance that should be 'at risk' could be challenging. This would require an assessment of the 'reasonable' costs that would be expected to arise as a result of outages, and this estimate is likely to be subject to significant uncertainty. For example, it could vary significantly with hydrology and unplanned generation outages.
- 4.8.12 A related issue is how to address any residual cost not borne by Transpower (assuming for the moment that it does not meet 100% of any increase in spot market costs). The broad options are:
- a) recover any residual from purchasers as uplift charge on spot market load
 - b) recover any residual from transmission customers

⁶⁴ Given that settlement prices computed without outages will be lower than the offer prices of some generators that were actually required to run when outages were taken into account for dispatch

- c) do not recover any residual amount – in effect any shortfall would be met by affected generators.

- 4.8.13 The first approach is similar to that taken in the SEM in Ireland (although in that market all constrained-on payments are met by purchasers, with no portion allocated to the grid owner). Assuming the grid owner met a significant portion of the total cost, recovery of the residual via an uplift charge could increase consumers' confidence in the efficiency of prices when a supplier is pivotal.
- 4.8.14 However, if the grid owner's portion was small and the incentives for cost minimisation were weak, the mechanism option would largely result in a reallocation of costs with no change in behaviour. In fact, incentives may worsen because the costs of pivotal generators would be spread over a broader base, possibly increasing their incentives to raise prices to inefficient levels when they pivotal.
- 4.8.15 The option of recovering any residual from transmission charges is expected to have similar effects to recovery via an uplift charge, although it would depend on the details of the transmission charging arrangements (which are currently no known).
- 4.8.16 The final option of not recovering any residual and letting it lie where it falls (i.e. generators do not receive offer price) is likely to have detrimental effects on security of supply because it would undermine generator confidence in the ability of spot market to reward the provision of last resort plant.

Overall effectiveness

- 4.8.17 In principle, the option of making the grid owner accountable for a portion of increased spot market costs caused by pivotal generators during transmission outages has some attractions. However, such a mechanism is expected to require substantial changes to the revenue control regime under which Transpower operates, would require careful coordination with the Commerce Commission, and may also involve legislative changes. It would also be important to consider possible unintended consequences, such as the potential for the grid owner to be dissuaded from undertaking some maintenance, to avoid costs associated with planned outages.
- 4.8.18 Given the range and complexity of the issues that would need to be addressed, this measure would best be considered as part of any broader

initiative to create appropriate incentives on Transpower to maintain grid availability, rather than being directed solely at situations involving a pivotal generator.

Q7. Do you consider that making the grid owner accountable for increased spot market costs caused by pivotal generators during outages would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?

4.9 Option 5 - General cap on offers or prices

- 4.9.1 In the pivotal supplier context, the key argument in favour of a general price or offer cap is that it would place an upper limit on participants' risk exposure. At present this exposure is theoretically unlimited, as the New Zealand market does not have any formal cap.⁶⁵
- 4.9.2 However, where general price or offer caps are utilised in overseas energy-only markets, they are set at fairly high levels to broadly reflect the assessed cost of involuntary demand curtailment, and/or to ensure adequate provision of last resort plant or voluntary demand response. For example, the price cap in the Singapore electricity market is \$5,000/MWh⁶⁶ and in the Australian NEM it is currently \$12,900/MWh.⁶⁷
- 4.9.3 Applying a general price or offer cap at these types of level would do little to address concerns about pivotal supplier situations. Further, there is a risk that a cap at these types of levels might be perceived as validating offers at that level in all pivotal supplier situations, not just those where there is a genuine shortage.

⁶⁵ If widespread instructed load shedding is implemented, the Code provides for spot prices to be subject to a price cap and floor mechanism (to reduce the scope for prices to diverge materially from assessed shortage values). The Code does not otherwise contain any formal price caps, although the market software introduces informal caps via the values used for constraint violation penalties.

⁶⁶ See the Appendix 6J.2 of the Singapore Electricity Market Rules (<http://www.emcsg.com/marketrules>).

⁶⁷ Prior to 1 July 2012 the price cap in the Australian NEM was \$12,500/MWh. From 1 July 2012 onwards, the AEMC has been required to re-calculate the price cap annually using a set formula that effectively increases the price cap by the CPI inflation rate each year. For information see AMEC's "Schedule of Reliability Settings (MPC and CPT for 2012-2013)", available here: <http://www.aemc.gov.au/electricity/guidelines-and-standards.html>.

- 4.9.4 In theory, this concern might be addressed by adopting a relatively low value for any general cap, but that would have the undesirable effect of suppressing prices at times of genuine scarcity, and therefore undermine incentives to maintain resources to ensure adequate reliability.

Overall effectiveness

- 4.9.5 A general price or offer cap is unlikely to increase purchaser confidence in the efficiency of prices in pivotal supplier situations because the regulator will not have better information than participants about the nature and costs of various alternatives. It may also reduce investor confidence in prices being sufficient at times to ensure revenue adequacy for last resort plant because of a perceived incentive on the regulator to dampen high spot prices even if they are economically justified.

Q8. Do you consider that a general cap on offers or prices would be effective at reducing efficiency concerns around pivotal supplier situations, and what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?

4.10 Option 6 - Temporary capping mechanism on pivotal supplier offers or affected prices

- 4.10.1 Under this option a temporary price cap would be applied in regions when a generator is 'pivotal',⁶⁸ or an offer cap would be applied only when a generator is 'pivotal'. Mechanisms of this broad type are used in some other electricity markets. For example, the PJM⁶⁹ market uses the 'Three Pivotal Supplier Test' (TPS). This test is used to determine whether any particular supplier plus the two largest suppliers would be jointly pivotal.⁷⁰ If the test

⁶⁸ The test could be based on pivotal status, or net pivotal status as discussed later.

⁶⁹ Covering parts of the north eastern United States, including Pennsylvania, New Jersey and Maryland.

⁷⁰ Each supplier, from 1 to n, is ranked from the largest to the smallest offered quantity of eligible capacity. Suppliers are then tested in order, starting with the three largest suppliers. If the system can satisfy demand without those three suppliers, their prices remain at the market-offer price. If demand can't be met without them, those three suppliers have their offers capped at their incremental costs. The test is then repeated for progressively smaller suppliers. If the test result shows that the two largest suppliers and generator n are jointly pivotal, generator n and the two largest suppliers have their offer price capped.

result is positive (i.e. they are jointly pivotal), the offer prices for the particular supplier and the two largest suppliers in that region are capped at pre-assessed estimates of their respective short run production costs.

- 4.10.2 A temporary capping mechanism would raise a number of design issues, which are discussed below.

Cap offers or prices

- 4.10.3 If a temporary cap were to be introduced, it could be applied to offers or prices. From an economic perspective, an offer cap is likely to be more effective because it would limit the ability of a pivotal party to adopt a high offer, but may still allow high prices to emerge through the actions of non-pivotal parties in a shortage situation.⁷¹ A price cap would also be less effective in addressing consumer concerns about the efficiency of prices if pivotal generators could receive constrained on payments for differences between their offer price and a (capped) spot price. In light of these factors, a cap on offers would be more attractive than a cap on prices.

Gross or net pivotal

- 4.10.4 The assessment of each supplier's status could be based on the gross position or net position. Both measures would be quite resource intensive if made on a half hourly basis across the full range of spatial levels (region, island and national). But the level of information required would rise significantly if an assessment were to be made of net positions. For example, a net assessment would require half hourly information on bilateral contract positions. This information could be quite difficult to assess where contracts are complex (such as swaptions). For these reasons, a gross pivotal measure is likely to be more practical for an ex ante approach. A net pivotal measure is more feasible if the test is applied on an ex post basis.

Ex ante or ex post

- 4.10.5 An ex ante approach would require real time information to be available on parties' generation resources (outages etc.) to allow a calculation of whether they were pivotal. The calculation would need to be made across a range of spatial levels (e.g. region, island, national), otherwise the mechanism would

⁷¹ Depending on how 'pivotal' is defined. If it is based on gross pivotal status, all suppliers will be pivotal in a shortage situation. Conversely, if it is based on net pivotal status, some supplies may not be pivotal in a shortage situation.

not identify local pivotal supply situations. If a pivotal supplier was identified, its offer would be capped.

- 4.10.6 An ex ante approach would also require ‘live’ information on the appropriate level to adopt for an offer cap for each generator. These values would probably need to be dynamic – for example to take account of changing fuel costs or opportunity values for stored water. In some overseas markets, this issue can be addressed by reference to another traded market. For example, generation costs may be calculated from spot gas prices, a heat rate and an allowance for variable costs. However, New Zealand lacks traded markets for fuel so it is difficult to estimate opportunity values for water and thermal fuel. This would complicate an ex ante approach.
- 4.10.7 In light of these factors, if a temporary price cap were adopted, it would be preferable for it to apply on an ex post basis. However, if it was applied ex post in every period (especially if applied before publication of settlement prices), this would encounter much the same issues as an ex ante approach. For this reason, the most workable approach is likely to be an ex post review process, where a cap can be applied if the Authority determined that relevant pre-conditions had been met – in particular that:
- a) a supplier was pivotal over a specified region and time period
 - b) the supplier’s offer prices were sufficiently high to warrant closer examination.
- 4.10.8 Upon review, this could trigger the imposition of an offer price cap during the affected trading periods and result in recalculation of prices for those periods if required.

Level of cap value

- 4.10.9 Calculation of the offer price cap values would be very important as during a genuine shortage situation many suppliers are likely to be pivotal. Accordingly, during genuine shortages, there is a high likelihood that spot prices will settle based on the cap value determined by the regulatory body. This means the process for setting the cap values can have important effects on unit commitment and investment decisions.
- 4.10.10 In the PJM market, the downside of mis-estimating cap prices is ameliorated by the presence of a separate capacity mechanism which is designed to provide incentives to make appropriate unit commitment and longer term investment decisions. However, the New Zealand market is based on an

energy-only payment to generators for actual production. There is no separate capacity mechanism. These factors mean that calculating the value for offer caps would require considerable care, as there would be significant potential for unintended adverse consequences.

Outline of possible temporary capping mechanisms

4.10.11 Table 3 summarises the discussion above and sets out some possible temporary capping mechanisms.

Table 3 Possible temporary capping mechanisms

Options	Key issues	Viable or not
A. <i>Ex ante</i> cap on offers of pivotal suppliers	1. Computationally intensive if applied over all relevant spatial levels. 2. Difficult to set ex ante cap level without undermining incentives to maintain reliable supply. 3. Difficult to test net pivotal positions on ex ante basis.	Not workable
B. <i>Ex post</i> cap on offers of pivotal suppliers run soon after every trading period	1. Very similar issues to ex ante cap, especially if within the time period used for publication of settlement prices	Not workable
C. <i>Ex post</i> cap on offers of pivotal suppliers applied only if a participant invokes review by Authority	1. Authority would need to set out criteria for when it would cap prices – in particular how it determines when an offer price is ‘unreasonably’ high 2. Authority would need to determine cap level if original offer determined to be	Most workable option

Options	Key issues	Viable or not
	unreasonable 3. Pricing would be re-run with new offer if required – need for wash-up or other process to address ex post adjustment to prices	
D. Cap to be applied to offers of any pivotal supplier that 'abuses' position for next (say) 12 months as future deterrent	1. Authority would need to set out criteria for when deterrent cap would be triggered - in particular how it determines when an offer price is high enough to constitute abuse 2. Authority would need to determine level of cap to apply as deterrent 3. A cap level that is fixed for the deterrent period would be simpler to apply – but may not reflect system conditions at times	Better than A and B, but likely to carry more risk of unexpected outcomes than 3

4.10.12 The first two temporary capping methods discussed in Table 3 are not viewed as being workable in the New Zealand context because of the difficulty of calculating cap values that change for each trading period and for each relevant node. The latter two methods would be more workable because the cap values would only be calculated on an 'as needed' basis. However, these methods would still raise some significant issues. In particular, assuming the provision would have general application across the range of pivotal supplier situations (i.e. not be confined to local pivotal supplier situations, however they may be defined), there is a high likelihood that they could be triggered during genuine widespread shortage situations.

4.10.13 For this reason, there is some risk that the standing offer/price cap in option D could become inappropriate at times. It might be possible to address this by providing for the cap to be suspended in 'genuine' security shortages, although it may be difficult to distinguish these from economic withholding. For this reason, it may be better to determine and apply the cap value on a situation specific basis as set out in option C.⁷²

Overall effectiveness

4.10.14 A temporary price or offer cap might increase purchaser confidence in the efficiency of prices in pivotal supplier situations, but it depends on the ability of a regulator to set prices at the 'correct' level, which is inherently hard to achieve. For the same reason, the mechanism is likely to reduce investor confidence in prices being sufficient at times to ensure revenue adequacy for last resort plant.

Q9. Do you consider that temporary capping mechanisms would be effective at reducing efficiency concerns around pivotal supplier situations, and what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?

4.11 Option 7 - Enforce a contract offer obligation where a supplier is expected to become pivotal

4.11.1 Under this option, a supplier that is expected to become pivotal would be required to offer contracts to affected parties so they can mitigate the risk of high spot prices.

4.11.2 This mechanism could take a range of forms. For example, it could provide a framework for parties to discuss contracting arrangements, and possibly also include a mediation process. Ultimately, the mechanism would need to empower an external party (presumably the Authority) to determine the contract price (and perhaps terms) if the parties cannot agree, otherwise the

⁷² This mechanism would have some similarities to a conduct provision that prohibited market abuse or manipulation. However, it would be more specific because a pivotal supplier situation (however defined) would need to exist before it could be triggered. Nor would there be any need to determine the intent of a party when formulating its plans. Another difference is that with a temporary price capping mechanism decisions on remedies could be made by the Authority rather than the Rulings Panel (who must determine alleged breaches of the Code).

supplier may simply take advantage of weak competition in the contract market rather than the spot market.

- 4.11.3 In terms of effectiveness, it is not clear how an enforced contracting option could improve consumer confidence about the efficiency of prices, given that an external party is unlikely to have better information or incentives than participants. Furthermore, this mechanism would not be effective where a supplier becomes pivotal unexpectedly, since parties will presumably not have an opportunity to use the mechanism to contract beforehand.
- 4.11.4 More generally, the determination of a contract price by a regulator would raise similar issues to the temporary price capping mechanism, (i.e. there are risks of inappropriately high or low contract prices, and a potential for unintended consequences). Indeed, there may be greater risks of unforeseen results with a contract mechanism because the regulator would potentially need to determine prices and terms.

Overall effectiveness

- 4.11.5 An enforced contracting mechanism appears unlikely to increase purchaser confidence in the efficiency of prices in pivotal supplier situations because the regulator is unlikely to have better information than participants about the nature and costs of various alternatives. The mechanism is unlikely to increase investor confidence in prices being sufficient at times to ensure revenue adequacy for last resort plant. Indeed there is a risk that the mechanism undermines normal contracting incentives.

Q10. Do you consider that an enforced contract offer obligation should be placed on pivotal suppliers, and what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?

5 Assessment of options

- 5.1.1 This section assesses the relative merits of the high level options described in the previous section compared with the status quo.

5.2 Basis of assessment

- 5.2.1 To assist in evaluating the extent to which the high level options contribute to the Authority's statutory objective, each option has been assessed against the following sub-criteria using a -5 to +5 scale:⁷³
- a) effectiveness at providing consumers with more confidence about the efficiency of prices during pivotal supplier situations
 - b) effectiveness at providing investors with confidence to invest in efficient levels of last resort plant or demand side management capability.
- 5.2.2 In addition, the extent to which each option carries a risk of unintended adverse effects has been assessed on a 0 to 5 scale. Note that in this case larger values represent more risk, rather than being a positive attribute.
- 5.2.3 Finally, the implementation difficulty of each option has been graded as either modest, medium, or significant, based on the expected lead time and cost that would be involved. The assessments and key underlying reasons are shown in Table 4.

⁷³ Positive values indicate an improvement relative to the status quo, and negative values a deterioration.

Table 4 Assessment of high level options relative to status quo

	Effect on consumer confidence re efficiency of prices in pivotal supplier situations	Effect on investor confidence to charge prices needed to get return on last resort plant	Risk of unintended adverse consequences	Implementation time and cost
Option 1 – Conduct provision	1 –Some improvement expected based on overseas experience	2 – Modest improvement expected based on NZEM experience	2 – Outcomes not entirely certain because depend on interpretation	Modest
Option 2 – Net Pivotal Declaration	2 – Provides more scope for purchasers to explore alternatives	-3 – Generators likely to perceive as significant intrusion on offer formation process with wider consequences than local pivotal supply situations	2.5 – Could lead to less reliable price schedules and/or less operational flexibility	Medium
Option 3 – Alter outage protocol to strengthen incentive for grid owner to manage outages	0.5 – Modest improvement to current arrangement	0.5 – Generator offers not directly constrained	1 – Small change reduces risk of unintended consequences	Modest
Option 4 – Make grid owner accountable for increased spot market	2.5 – Potentially improves confidence – but depends on	0.5 – Generator offers not directly constrained	5 – Issues are complex, and limited international	Significant

	Effect on consumer confidence re efficiency of prices in pivotal supplier situations	Effect on investor confidence to charge prices needed to get return on last resort plant	Risk of unintended adverse consequences	Implementation time and cost
costs during outages	incentive on and ability of grid owner to get more efficient solutions		precedents	
Option 5 – General offer cap	2 – May narrow range of outcomes dependent on level of cap	-1 – May suppress prices in genuine scarcity situations	5 – Significant risk of leading to higher prices when there is no real scarcity	Medium
Option 6 – Temporary offer caps	3.5 – If successful, could act as check on inefficient pricing/offers	-2.5 – May suppress prices in genuine scarcity situations	3 – Hard to set cap in hydro dominated system – limited overseas precedent in energy-only markets	Significant
Option 7 – Enforce contracting on pivotal suppliers	1 – Only works where event is known with sufficient lead time to allow for contracting	-2.5 – May suppress prices and lead to inappropriate contract terms	4.5 – Significant change – not aware of any experience in other energy-only markets	Significant

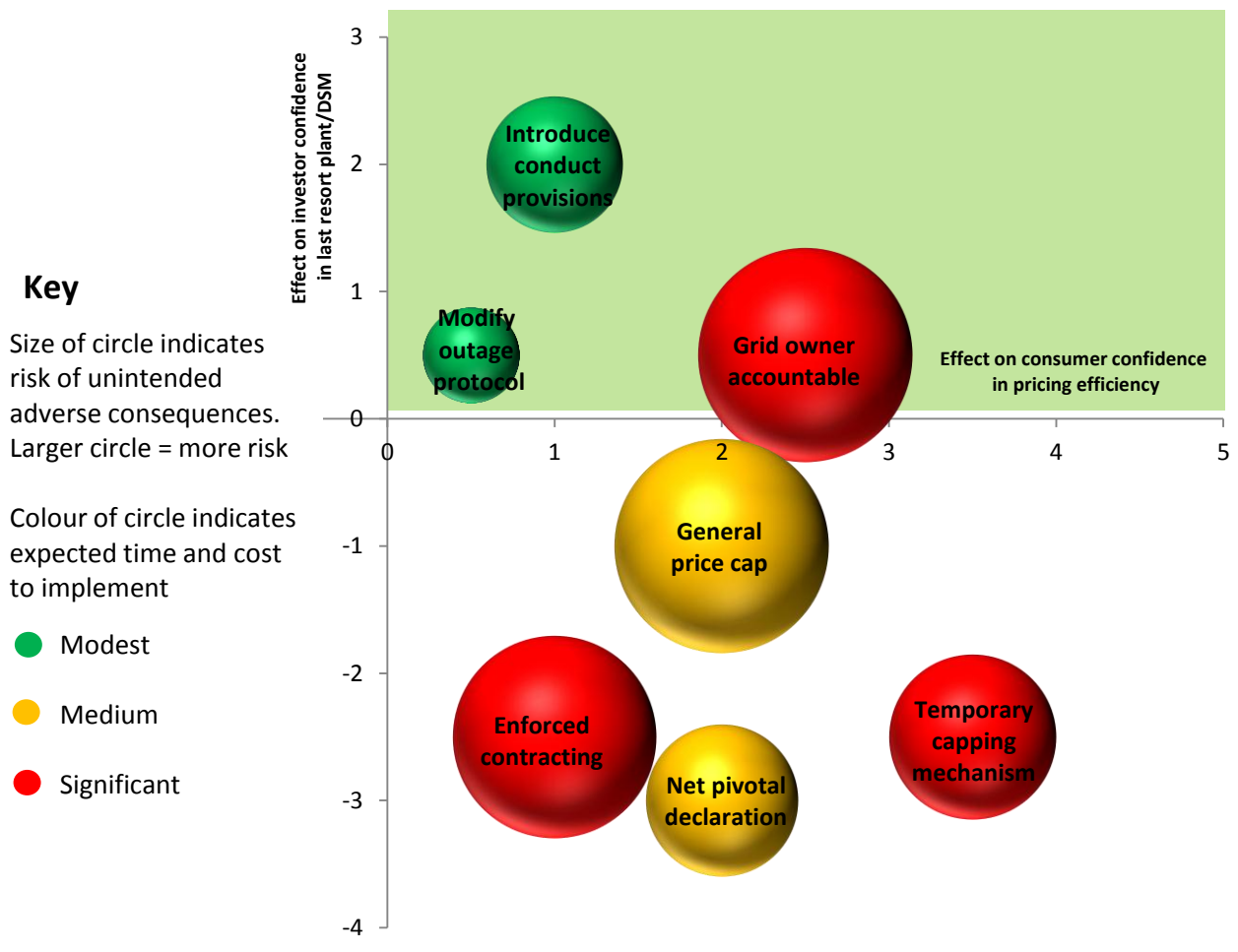
Q11. Do you agree with the assessment of the high level options against the criteria in Table 4? If not, why not?

6 Recommendations

- 6.1.1 The assessment information from Table 4 has been used to develop recommendations on which options should be considered further.

6.2 Implications of assessment

- 6.2.1 Figure 1 summarises the assessment information in diagrammatic form. The horizontal axis measures the extent of improvement in consumer confidence in pricing efficiency during pivotal supplier situations. The vertical axis indicates the extent of improvement in investor confidence in last resort plant or demand response capability. The origin (zero, zero) position represents the status quo.
- 6.2.2 Each high level option is shown by a circle, located to indicate how it performs when assessed against the 'consumer confidence' and 'investor confidence' criteria shown on the horizontal and vertical axes.
- 6.2.3 The size of each circle represents the expected risk of unintended adverse outcomes for an option. The larger the circle, the greater the level of risk. The assessed level of implementation time and cost is shown by the colour of the circle, with green being lowest and red being greatest.
- 6.2.4 From a policy perspective, the ideal is to identify options that improve consumer and generation investor confidence, have low risk of adverse outcomes and modest implementation issues. Such options would be in the upper right hand quadrant (shaded in pale green) of the figure, and be represented by small green circles.

Figure 1 Overall performance of high level options

6.2.5 Only two reform options are in the green quadrant and have modest implementation time and cost. They are:

- Modify outage protocol to improve grid availability incentives
- Introduce conduct provisions.

6.2.6 Modifying the outage protocol is expected to yield some incremental benefits, but by itself would not fundamentally alter performance relative to the status quo. The introduction of conduct provisions into the Code has greater potential benefits than modifying the outage protocol, and could be implemented fairly swiftly assuming provisions are based broadly on those in the NZEM or MARIA (or on similar overseas rules).

6.2.7 The other option in the green quadrant that could improve outcomes in pivotal supplier situations is to make the grid owner more accountable for

costs arising from transmission outages. However, this would require substantial changes to current arrangements, including possible legislative amendments. Given the range and complexity of the issues involved, the WAG believes that this measure would best be considered as part of any broader initiative to incentivise grid availability, rather than as a specific measure to address pivotal generator situations.

- 6.2.8 Among the remaining options, the mechanism that offers the greatest direct potential to improve consumer confidence is the introduction of a temporary capping mechanism on prices or offers. However, it is assessed as being likely to reduce investor confidence to invest in last resort generation or demand response resources.
- 6.2.9 This option is also expected to require more time and effort to implement and carry greater risk of unintended adverse outcomes, than the introduction of conduct provisions or modifications to the outage protocol. However, this mechanism has the greatest potential to improve consumer confidence in pricing outcomes in pivotal supplier situations, if that objective was the dominant concern. This raises the question of whether there are any modifications to the temporary capping mechanism that could reduce the risk to investor confidence in last resort resources, while boosting consumer confidence in pricing outcomes.

Q12. What, if any, modifications could be made to a temporary capping mechanism to reduce the risk of adverse effects on investor confidence in last resort resources, without significantly eroding the beneficial impact on consumer confidence in pricing outcomes?

- 6.2.10 Conversely, provided conduct provisions operate as intended, they should have similar effects to a temporary capping mechanism because suppliers should be less likely to increase their offer prices solely to take advantage of a temporary thinning of competition. Furthermore, if a supplier did take such action, it would be likely to prompt an alleged breach of the conduct provisions and possible remedies. This raises the question of whether there are any modifications to conduct provisions that could improve their performance in relation to consumer confidence in pricing outcomes, while retaining the benefits for investor confidence in last resort resources.

Q13. What, if any, modifications could be made to conduct provisions to improve its impact on consumer confidence in pricing outcomes, without significantly eroding the beneficial impact for investor confidence in last resort resources?

6.2.11 Based on the information that is currently available, the WAG considers that the Authority should investigate the introduction of conduct provisions and changes to the outage protocol, and proposes that the temporary capping mechanism be regarded as the preferred ‘fall back’ option.

6.2.12 The temporary capping mechanism could be progressed if conduct provisions and modifications to the outage protocol proved to be insufficient, or if new information emerges to place priority on improving consumer confidence in pricing outcomes ahead of other objectives. For example, if a change in offer behaviour occurred which heightened concerns about pricing in pivotal supplier situations, this could warrant a reassessment of the options. Alternatively, there could be merit in reviewing the performance of any Code changes within some defined period of them taking effect.

Q14. What circumstances or conditions should trigger a reassessment of the options for addressing concerns relating to pricing outcomes in pivotal supplier situations? Should the effectiveness of measures be reviewed after a defined period?

6.3 Recommended approach

Introduce conduct provisions in Code

6.3.1 The WAG recommends that the Authority consider including conduct provisions in the Code modelled on those contained in the NZEM or MARIA Rules. For ease of reference, a possible form of the changes is set out in Appendix E.

Q15. Do you agree that the Authority should consider adding conduct provisions to the Code? If not, why not?

- 6.3.2 In addition to the specific conduct provisions, the WAG recommends that the Authority consider including a provision in the Code relating to the formation of offers along the lines of that included in the NZEM rules. For ease of reference, a possible form of this change is set out in Appendix E.

Q16. Do you agree that the Authority should consider adding a provision relating to formation of offers similar to that in the NZEM rules? If not, why not?

- 6.3.3 To reinforce the introduction of conduct provisions, certain participants could also be required to provide an annual compliance statement from their Board to the Authority, certifying that the Board is satisfied that the steps taken by the participant were likely to result in its employees being aware of the conduct provisions.
- 6.3.4 This requirement would apply to all participants submitting offers of any product (e.g. energy, reserve of any type, frequency keeping) to WITS, since these are the parties most likely to become pivotal suppliers at some time, and would require the signature of two directors, or one director and either the chief executive or chief financial officer.⁷⁴

Q17. Do you consider that an annual compliance certificate requirement would be desirable, and what is your reasoning?

Amend net benefit test in Outage Protocol to include competition effects

- 6.3.5 The WAG recommends that the Authority consider a Code change to broaden the net benefit test in the Outage Protocol to include competition effects.
- 6.3.6 One possible approach would be to incorporate broadly similar provisions to those within the Commerce Commission's Capital Expenditure Input Methodology which is part of the revenue control regime for Transpower, given that this includes competition effects within its assessment framework.

⁷⁴ This is the same level of sign-off as for the stress testing regime provided in clause 13.236F of the Code.

Q18. Do you agree that the Authority should consider a Code change to broaden the net benefit test in the Outage Protocol to include competition effects? If not, why not?

Treat temporary capping mechanism as fall back option

6.3.7 The WAG recommends that the Authority treat the introduction of a temporary capping mechanism as the preferred fall back option. This option could be progressed if conduct provisions and modifications to the outage protocol proved to be insufficient, or if new information emerges to place priority on improving consumer confidence in pricing outcomes in pivotal supplier situations ahead of other objectives.

Q19. Do you agree that the Authority should consider introducing a temporary capping mechanism as the preferred fall back option? If not, why not?

Appendix A Summary of consultation questions

A.1.1 The questions on which comment is specifically sought in relation to this discussion paper are as shown in Table 5.

Table 5 Table of questions

No.	Question
Q1	Do you agree with the assessment of the potential efficiency losses of pivotal supplier situations for both localised situations and wider area situations? If not, why not?
Q2	Are there any other high level options for addressing issues with local pivotal supplier situations that should be considered?
Q3	Do you agree with the assessment that the status quo is not sufficient if there are other options available that have low implementation risk and cost, and that could reduce efficiency concerns about pivotal supplier situations?
Q4	Do you consider that adding conduct provisions to the Code would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning and which type of conduct provisions do you advocate and why?
Q5	Do you consider that the net pivotal declaration mechanism would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning? Is it likely to lead to any unintended consequences, and if so, what might these be?
Q6	Do you consider that amending the Outage Protocol to include competition effects in the net benefit test would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning?
Q7	Do you consider that making the grid owner accountable for increased spot market costs caused by pivotal generators during outages would be effective at reducing efficiency concerns around pivotal supplier situations, and if so what is your reasoning?

No.	Question
Q8	Do you consider that a general cap on offers or prices would be effective at reducing efficiency concerns around pivotal supplier situations, and what is your reasoning?
Q9	Do you consider that temporary capping mechanisms would be effective at reducing efficiency concerns around pivotal supplier situations, and what is your reasoning?
Q10	Do you consider that an enforced contract offer obligation should be placed on pivotal suppliers, and what is your reasoning?
Q11	Do you agree with the assessment of the high level options against the criteria in Table 4? If not, why not?
Q12	What, if any, modifications could be made to a temporary capping mechanism to reduce the risk of adverse effects on investor confidence in last resort resources, without significantly eroding the beneficial impact on consumer confidence in pricing outcomes?
Q13	What, if any, modifications could be made to conduct provisions to improve its impact on consumer confidence in pricing outcomes, without significantly eroding the beneficial impact for investor confidence in last resort resources?
Q14	What circumstances or conditions should trigger a reassessment of the options for addressing concerns relating to pricing outcomes in pivotal supplier situations? Should the effectiveness of measures be reviewed after a defined period?
Q15	Do you agree that the Authority should consider adding conduct provisions to the Code? If not, why not?
Q16	Do you agree that the Authority should consider adding a provision relating to formation of offers similar to that in the NZEM rules? If not, why not?
Q17	Do you consider that an annual compliance certificate requirement would be desirable, and what is your reasoning?

No.	Question
Q18	Do you agree that the Authority should consider a Code change to broaden the net benefit test in the Outage Protocol to include competition effects? If not, why not?
Q19	Do you agree that the Authority should consider introducing a temporary capping mechanism as the preferred fall back option? If not, why not?

Appendix B Extent of issues with current arrangements

B.1 Introduction

- B.1.1 As discussed in section 3, no efficiency losses have been identified that can be directly attributed to the recent local pivotal supplier events.⁷⁵ However, this is not surprising as the situations are still fairly recent and effects would be expected to emerge over time.
- B.1.2 More generally, offer prices in some recent pivotal supplier situations have been much higher than in the past, and it is not clear whether the upward movement will continue or stabilise. This means that history may not provide a reliable guide to the future. For this reason, the WAG has considered the potential for efficiency losses to arise in the future, based on the frequency of pivotal supplier situations that can be expected for underlying physical reasons, the plausible bounds for pivotal supplier action, and the possible counter responses this could elicit from purchasers and end-consumers.
- B.1.3 In carrying out this analysis, the WAG has focussed largely on local pivotal supply situations as this was the type of event that triggered the Authority's original request for advice. However, the WAG notes that pivotal supplier situations need not be confined to a local area. For this reason it has also undertaken some analysis regarding pivotal supplier events that affect a much broader area, such as an island or the entire country. Considering both types of event assists in determining the extent of any problems with current arrangements, and the nature of any recommended changes.

B.2 Localised pivotal supplier situations – potential efficiency impacts

- B.2.1 Analysis published by the Authority identified a number of areas subject to local pivotal supply.⁷⁶ A summary of this information is shown in Table 6.

⁷⁵ It is understood that at least one retailer has informed the Authority that it is not seeking customers in some regions due to increased concerns about exposure to high prices when suppliers are pivotal. This type of action can lead to efficiency losses through weaker competition, as discussed later in this section. See also the discussion in paragraph B.2.4.

⁷⁶ <http://www.ea.govt.nz/document/17037/download/industry/monitoring/enquiries-reviews-investigations/2012/>.

In compiling a list of areas where pivotal supplier situations are expected to periodically occur in future, the following areas are omitted:

Pricing in Pivotal Supplier Situations

Wholesale

Advisory Group

Table 6 Localised areas subject to periodic exposure to pivotal suppliers

Name	GXPs affected	Pivotal supplier	Main purchaser(s) affected (estimated)	How does the situation arise?	Load in the affected region	How frequently could the generator be pivotal?
Cobb	COB, MOT, MPI, UTK	Cobb (TrustPower)	Contact	Outage of STK_T3 islands this region	~15 MW	~30 hours per year
Tekapo	ABY, TKA	Tekapo A (Genesis)	Contact	Outage of ABY_TIM_1 or ABY_TKA_1 islands this region	~3 MW	~110 hours per year
Karapiro	CBG, HIN, TMU	Karapiro (MRP)	Genesis TrustPower Fonterra?	Outage of HAM_KPO_1 or HAM_KPO_2 leaves the region import constrained	~80 MW	~60 hours per year, though MRP is probably <i>net</i> pivotal substantially less often (if ever)

Name	GXPs affected	Pivotal supplier	Main purchaser(s) affected (estimated)	How does the situation arise?	Load in the affected region	How frequently could the generator be pivotal?
Waikaremoana I	RDF, FHL, WRA, GIS	Waikaremoana (Genesis)	Contact TrustPower	Outage of RDF_T3 or RDF_T4 leaves the region import constrained	~120 MW	~20 hours per year, though Genesis is probably <i>net</i> pivotal substantially less often (if ever)
Waikaremoana II	FHL, WPW	Waikaremoana (Genesis)	Contact Meridian	Waipawa split disconnects WPW from DVK, creating a spring washer situation	~40 MW	~180 hours per year??
Waikaremoana III	GIS, WRA, FHL	Waikaremoana (Genesis)	Contact TrustPower	Outage of RDF_TUI_1 or RDF_TUI_2 creates a spring washer situation	~70 MW	~40 hours per year??

Name	GXPs affected	Pivotal supplier	Main purchaser(s) affected (estimated)	How does the situation arise?	Load in the affected region	How frequently could the generator be pivotal?
Waikaremoana IV	FHL	Waikaremoana (Genesis)	Contact	Outage of FHL_RDF_1 or FHL_RDF_2 creates a spring washer situation	~30 MW	~50 hours per year??
Waikaremoana V	GIS, WRA, FHL	Waikaremoana (Genesis)	Contact TrustPower	Outage of FHL_RDF_1 or _2 and FHL_TUI_1 or _2 leaves the region import constrained	~70 MW	~30 hours per year
Greymouth	GYM, KUM, HKK, OTI, APS, CLH, COL	Coleridge and Kumara (TrustPower)	Contact	Outage of DOB_KUM_1 leaves the region import constrained	~20 MW	Over 300 hours per year, though TrustPower is probably <i>net</i> pivotal substantially less often (if ever)

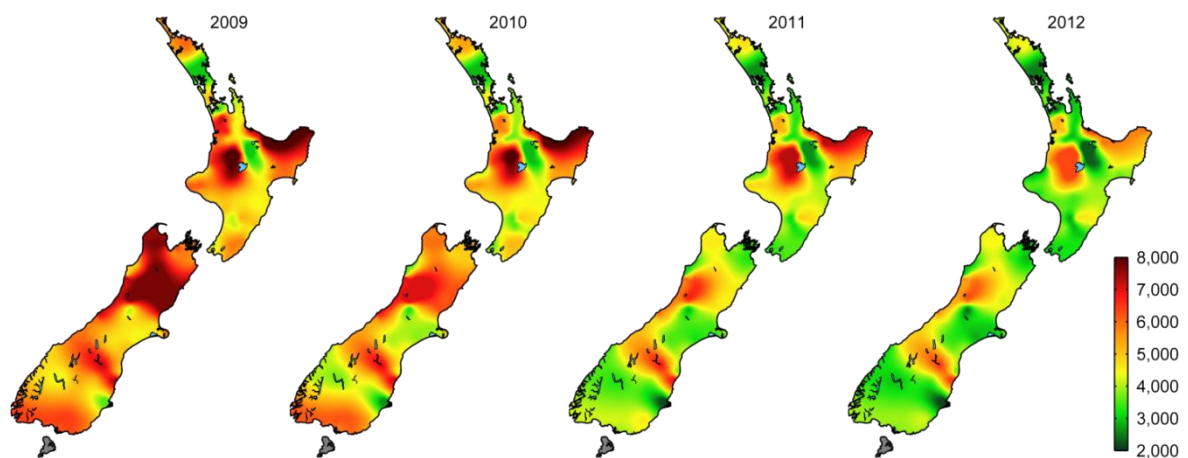
Name	GXPs affected	Pivotal supplier	Main purchaser(s) affected (estimated)	How does the situation arise?	Load in the affected region	How frequently could the generator be pivotal?
Timaru	TIM, TMK, ALB, TKA	Tekapo A (Genesis)	Contact	Outage of 220/110 kV interconnecting transformer could, in future, leave the region import constrained	~120 MW	Rarely if ever at present
Halfway Bush	HWB	Waipori (TrustPower)	Unclear	Outage of HWB_T5 could leave the GXP import constrained	~120 MW	Unclear
Lower South Island 110 kV	GOR, BDE, EDN, BAL	Waipori (TrustPower)	Unclear	Outages at HWB_T4, ROX_T10 and/or ROX_HWB_1 or _2 could create a spring washer situation	Unclear	Unclear

Name	GXPs affected	Pivotal supplier	Main purchaser(s) affected (estimated)	How does the situation arise?	Load in the affected region	How frequently could the generator be pivotal?
Bay of Plenty	Entire region	Atiamuri and Ohakuri (MRP) or Aniwhenua, Matahina and Kaimai (TrustPower)	Unclear	Outage(s) between Aratiatia, Ohakuri, Atiamuri and Whakamaru may leave the region import constrained	>>100 MW	Unclear

Potential productive efficiency loss – local pivotal supplier situations

- B.2.2 To mitigate price risk arising from a local pivotal supplier, affected purchasers are likely to seek hedge cover from the pivotal supplier. However, this may not be available, or may only be available at a price that reflects an expectation of spot prices achievable during pivotal supply periods.
- B.2.3 In that situation, purchasers are likely to consider other mitigation strategies such as raising tariffs, changing their retail coverage, seeking additional transmission capacity, arranging short term demand response, bringing in mobile generation, or even investing in local peaking generation. The most likely response is for retailers with exposure to withdraw coverage from these areas. This means that retail competition would be expected to be thinner in areas subject to pivotal supply risk.
- B.2.4 Figure 2 shows data on the degree of retail market concentration by location and across time.⁷⁷ Green areas have lower market concentration and red areas have higher concentration. At the 'macro' level, the general picture has been of reducing market concentration as retailers have expanded their service territories and incumbent suppliers have come under increased competition. However, some areas have seen much lesser improvement and these often coincide with the areas subject to local pivotal supplier risk as set out in Table 6.
- B.2.5 However, the picture is not entirely clear cut. For example, the Tasman/Motueka and East Cape areas are exposed to pivotal supply, but have market concentrations that are in the intermediate range. Similarly, there has been no discernible increase in market concentration in the Tekapo and Cobb areas between 2011 and 2012, even though high prices were observed in mid-2012. On the other hand, the market concentration in the Cobb area had been declining sharply until 2011, and levelled off in 2012.

⁷⁷ Hirschman Herfindahl Indices have been used. They represent the sum of the squares of the market shares of retailers, expressed as an index, where one supplier with 100% share is 10,000.

Figure 2 Market concentration indices through time

- B.2.6 In short, retail competition is expected to be sensitive to pivotal supplier risk, but there are other factors that also affect service coverage decisions.
- B.2.7 In terms of efficiency effects, a reduction in retail competition would weaken the pressure to minimise operating costs. Reducing retail costs (by improving retail competition) was one of the key drivers for the introduction of financial transmission rights (FTRs). The cost-benefit analysis for the introduction of inter-island FTRs estimated a productive efficiency benefit in the range of \$4-8 million per year as a result of increased retail competition.⁷⁸ This benefit was assumed to phase in over five years, giving rise to a PV of approximately \$20-40 million over ten years.
- B.2.8 Using that as a point of reference, the equivalent efficiency effects for local pivotal supplier situations would be expected to be considerably smaller because the amount of load affected is much lower (hundreds of MW rather than thousands). It is therefore assumed that the efficiency loss as a result of increased retail operating costs is roughly 5% of that estimated for FTRs – i.e. approximately up to \$1-2 million in present value terms.
- B.2.9 Although they are less likely, other productive efficiency effects could arise. If a local pivotal supplier so wished, it could in principle raise local average

⁷⁸ <http://www.ea.govt.nz/document/13334/download/our-work/consultations/priority-projects/lpr-proposed-amendments/>

spot prices (and hence retail and contract prices) to reflect the cost of the next best alternative from the point of view of local end-users, since these parties cannot readily leave the area (unlike retailers).

- B.2.10 For this reason, the cost of investment in back-up generation is likely to represent an upper limit in terms of direct productive efficiency losses.⁷⁹ If such generation was built, the most likely form would be reciprocating generation sets or diesel-fired open cycle gas turbines (OCGTs). Table 7 shows the mean number of hours of operation required per year for this type of plant to break even at different levels of cost, where:
- (a) the \$145/kW/year figure reflects the estimated fixed costs of a new OCGT
 - (b) the \$73/kW/year figure is based on the assumption that only half the fixed costs need to be recovered during pivotal supplier situations. An OCGT would also provide other benefits (e.g. during island-level supply shortages), which would reduce the effective incremental cost to the investor.
- B.2.11 The assumption is that the output of the new generation (in MW) would be equal to the investor's load in the affected area during pivotal supply periods (assuming, for simplicity, perfect reliability and perfect foresight). In some cases a smaller generating plant might be sufficient to deny the local supplier pivotal status (or an even smaller plant might be sufficient to deny net pivotal status). This would make it easier to reach the breakeven point.

⁷⁹ It could be suggested that local pivotal supplier situations might be mitigated through transmission investment and that such investment might be inefficient. However, Transpower's internal processes and the Commerce Commission's investment approval regime are designed to 'filter out' any interconnection investment that aims to increase competition within a region, but is not efficient even when competition benefits are taken into account. However, there remains the possibility that a wholesale purchaser could contract bilaterally with Transpower to carry out a transmission investment intended to increase capacity into a region, and that such investment might be inefficient. However, generation alternatives would generally be expected to be cheaper in these situations.

Table 7 Hours of pivotal supplier per year for investment in new OCGT to break even

Spot price during pivotal supplier situations	Annualised fixed costs, \$/kW/year			
	36	73	109	145
1,000	54.1	108.2	162.3	216.4
3,000	13.6	27.2	40.7	54.3
5,000	7.8	15.5	23.3	31.0
10,000	3.7	7.5	11.2	15.0
20,000	1.8	3.7	5.5	7.4
50,000	0.7	1.5	2.2	2.9

B.2.12 Table 8 shows a subset of areas from Table 6 where local pivotal supplier situations are expected to occur for at least 30 hours per year in future.

Table 8 Areas where a supplier is likely to be pivotal

Area	Pivotal supplier	Amount of load affected (approx. MW)	Estimated frequency (hours per year)
Motueka	Cobb	15	30
Tekapo	Tekapo A	3	110
Te Awamutu	Karapiro	80	60
East Cape	Waikaremoana	~100	50
Greymouth	Coleridge, Kumara	20	300+

- B.2.13 New generation would face a fixed cost of around \$145/kW/year, but some of this cost would be justified by economic benefits at times of genuine tight supply or scarcity. Assuming 50% of the cost is not justified by such benefits (and is only directed at mitigating pivotal supply risk), the efficiency cost of such investment would be \$73/kW/year. This equates to approximately \$0.5 million per MW in present value terms when discounted at 8% over ten years.
- B.2.14 In addition, there may be some operating inefficiency to the extent that the variable costs of a stand-by plant exceed the marginal costs of the pivotal supplier. However, it is difficult to estimate the latter because they will be situation specific. For example, the pivotal supplier may incur costs to run in a less than optimal manner, or need to recover investment costs that are specific to pivotal supply periods (e.g. the cost of local frequency keeping capability). It appears unlikely that such costs would exceed the expected variable costs of a back-up generator (around \$400/MWh). In light of the uncertainty, no operating inefficiency loss has been included (i.e. it is assumed that local pivotal suppliers incur variable costs equivalent to back-up generation).
- B.2.15 The potential efficiency loss is therefore estimated at \$24 million in present value terms based on an assumption that 50 MW of inefficient investment occurs in back-up generation. As noted above, this estimate should be treated as an upper bound on the likely productive efficiency losses because most parties have alternative risk mitigation options.

Potential allocative efficiency loss – local pivotal supplier situations

- B.2.16 It is possible that changes in offer behaviour will result in an increase in mean spot prices in regions where a supplier is frequently pivotal. This may, in turn, result in an increase in the price paid by end consumers (both retail customers and major users) in the affected regions.
- B.2.17 Table 9 sets out the implied change in mean spot prices, for a range of assumptions about the frequency of pivotal supplier situations and the level to which the spot price may be set during these situations.

Table 9 Uplift in mean spot price (\$/MWh)⁸⁰

		Frequency (hours per year)			
		10	20	50	100
Spot price during pivotal supplier situations	1,000	+1	+2	+5	+10
	3,000	+3	+7	+17	+33
	5,000	+6	+11	+28	+56
	10,000	+11	+23	+57	+113
	20,000	+23	+46	+114	
	50,000	+57	+114		

B.2.18 This table highlights that:

- (a) any change in wholesale prices will be very sensitive to the frequency of pivotal supplier situations, and the level of spot price at those times
- (b) even relatively infrequent pivotal supplier situations (e.g. 10 hours per year on average) can lead to a noticeable change in mean spot prices.

B.2.19 The last point is especially relevant because it may lead to market participants taking actions that have efficiency consequences in advance of any high spot prices actually being observed. The consequences of waiting to see the level the spot prices in pivotal supplier situations may be unpalatable. For instance, the uplift in mean price might render the operations of a retailer (earning a margin of e.g. \$5-10/MWh on sales) unprofitable.

B.2.20 An increase in the variable cost paid by end consumers is expected to cause some inefficient demand response resulting in deadweight loss (i.e. allocative inefficiency). The Authority typically assumes a price elasticity of 0.26 for cost-benefit analysis (i.e. a 10% increase in mean price is expected to result in a 2.6% decrease in consumption).

B.2.21 For the purposes of this analysis, two scenarios are considered:

⁸⁰ The table assumes an average spot price of \$70/MWh outside pivotal supplier situations.

- (a) a *lower* scenario, in which 100 MW of load experiences an \$8/MWh increase in mean price;⁸¹ and
- (b) a *higher* scenario, in which 200 MW of load experiences an \$8/MWh increase in mean price.

- B.2.22 The quantity assumptions (100/200 MW) appear reasonable, in that Table 6 identifies a rather greater quantity of load that is potentially exposed to pivotal supplier situations.
- B.2.23 The price uplift assumption is based on the cost of back-up generation discussed in paragraph B.2.13, but converted to a \$/MWh basis over a year.
- B.2.24 The lower scenario is expected to result in a deadweight loss of \$0.02 million per year; the high scenario a deadweight loss of \$0.05 million per year.⁸²
- B.2.25 The range of allocative efficiency losses is therefore estimated at \$0.1 - \$0.4 million over ten years when discounted at 8%.

Potential dynamic efficiency loss – local pivotal supplier situations

- B.2.26 In principle, dynamic efficiency effects might also arise, but the load directly exposed to local pivotal suppliers is a relatively small proportion of total demand. For this reason, dynamic effects are not expected to be material in their own right (although there may be flow-on effects as discussed later).

⁸¹ For the sake of simplicity, the shape of the load is ignored.

⁸² Based on the assumptions that energy costs make up half the delivered price paid by the consumer.

B.3 Wider pivotal supplier situations – historical analysis

- B.3.1 As noted earlier, while the WAG has focussed largely on local pivotal supply situations, it has also undertaken some analysis of wider pivotal supplier events to inform its consideration of the issues.
- B.3.2 In this context, an analysis of historic demand and supply capability was undertaken to identify the extent to which suppliers have been pivotal at the national or island level in the period from January 2009 to December 2011.⁸³
- B.3.3 For each trading period over this three-year span, the analysis identified whether a generator was pivotal at the island or national level – i.e. whether the market could have cleared with normal levels of reserve cover if that generator did not offer in any of its controllable generation (i.e. excluding generation that is not available on a discretionary basis such as wind or geothermal).
- B.3.4 In making this assessment, the results are quite sensitive to the measure of capacity that is used. If full nameplate capacity was to be used, this would reduce the estimated frequency of pivotal supply situations as it ignores the effect of planned and unplanned plant outages. Conversely, if offered generation was to be used, this would increase the estimated frequency because it would treat generation that was not committed as being unavailable. While this could be viewed as strictly correct for each trading period, if price risk were a concern to parties, this would presumably lead to higher rates of plant commitment. For this reason, use of offered generation is likely to overstate the frequency of pivotal supply situations when viewed in underlying economic terms.
- B.3.5 The analysis undertaken for the WAG used nameplate generation capacity, minus any planned outages of the seven major thermal units (i.e. Huntly units 1-4, e3p, Taranaki Combined Cycle plant, and Otahuhu B). This measure effectively treats all large thermal plant as available unless it was included in planned outage information available to all participants. The analysis does not include the effect of unplanned generation outages (except as they affected actual geothermal and wind generation). However, unplanned generation outages would not typically be expected to lead to

⁸³ This was initiated after Genesis Energy tabled analysis of these broader issues undertaken for it by Castalia Strategic Advisers (Castalia). The broad framework used by Castalia has been utilised by the WAG, though with a number of differences and extensions.

pivotal suppliers raising their offers, as such outages would typically emerge after gate closure. It is only where unplanned outages have occurred and resulted in a sustained period of lost capacity that other parties would have had an opportunity to re-price their offers.

- B.3.6 The analysis determined the total generation requirement for each trading period, using actual demand including transmission losses (or rather, actual generation, plus or minus HVDC transfers as appropriate for the Island analysis), plus 50MW per Island for frequency keeping purposes, and IR estimated at 400MW in the North Island, and 120MW in the South Island. The analysis does not consider demand-side response (except in the form of interruptible load).
- B.3.7 The analysis made the simplifying (conservative) assumption that the full HVAC grid was always available. The analysis of island-level pivotal situations did consider the impact of the HVDC configuration. Received HVDC transfers were assumed to be the lesser of:
- (a) the amount of surplus generation in the other island
 - (b) the level that could be received without increasing IR requirements – that is:
 - (i) nil, during bipole outages
 - (ii) 400 MW in the North Island or 120 MW in the South Island, at times when HVDC Pole 1 was historically unavailable; or
 - (iii) 585 MW in the North Island or 120 MW in the South Island, at times when HVDC Pole 1 was available with restricted capacity.
- B.3.8 Based on this framework, the number of hours in which each generator was pivotal was calculated. The results are summarised in Table 10.

Table 10 Estimated hours of pivotal supply between 2009 and 2011 (and % of time)

Supplier	Estimate of time that supplier was pivotal		
	NZ	North Island	South Island
Contact	53 (<1%)	787.5 (3%)	0
Genesis	670 (2.5%)	5,563.5	0

Supplier	Estimate of time that supplier was pivotal		
	NZ	North Island	South Island
		(21%)	
Meridian	1,465 (5.5%)	0	20,161.5 (76%)
MRP	130.5 (<1%)	2,510 (9.5%)	0
All others	0	15 (<1%)	0
Total pivotal events	1471.5 (5.6%)	5,613 (21%)	20,161.5 (76%)

- B.3.9 In short, the analysis suggests that Meridian was very frequently (76% of the time) pivotal in the South Island and moderately often (5.5% of the time) pivotal nationally. Genesis was often (21% of the time) pivotal in the North Island and sometimes (2.5% of the time) pivotal nationally. MRP and Contact were also sometimes pivotal in the North Island, and rarely pivotal nationally.
- B.3.10 There would have been a very few occasions where (due to a supply shortfall) *all* suppliers in the North Island were pivotal.⁸⁴
- B.3.11 The analysis above shows the amount of time that each supplier was pivotal, and therefore able to increase spot prices. It does not consider whether such parties had an incentive to raise prices. In practice, the short term incentive may be moderated by a supplier's contract position (i.e. they may not be *net* pivotal once retail load and other contracts are taken into account). For example, the results of recent stress tests indicate that most participants' cash flows are relatively invariant to high spot prices.⁸⁵

⁸⁴ The analysis shows that Meridian is theoretically pivotal in the North Island where there is an overall generation shortfall. However, because they have no discretionary controllable generation (only wind generation), and hence no ability to act on that position, it has been recorded as a zero in Table 10.

⁸⁵ For example, results received for the fourth quarter indicate that the cash flows of:

- 22 of the 23 respondents were not negatively affected by an eight-hour sudden price shock of \$10,000/MWh
- 19 out of 23 respondents were not negatively affected by a mean spot price of \$250/MWh

- B.3.12 However, unless contracts have fixed prices and relatively long terms, suppliers may still prefer higher spot prices, as these will presumably support higher contract prices in the future. For this reason, the threat of demand response or new generation entry may be more important constraints on prices over time.
- B.3.13 In order to assess the effect of contract positions on suppliers' short term incentives, the *gross* pivotal analysis described above was extended to a *net* pivotal analysis, by factoring in the estimated contract position of major gentailers.
- B.3.14 The contract position of each gentailer (in each island, in each trading period) was estimated based on:
- (a) retail load commitments, which were estimated using reconciliation data provided by the Clearing Manager⁸⁶
 - (b) an estimate of the effect of the Tiwai smelter contract on Meridian's purchase commitments, and other generators' arrangements with large users (estimated from public data, where available)
 - (c) the virtual asset swaps entered into between Genesis, Meridian and Mighty River Power (based on published information on these contracts).
- B.3.15 It is important to emphasise that these estimates are approximate. Exchange-traded products and bilaterally negotiated over-the-counter contracts (OTC) were not factored into the analysis due to lack of half-hourly contract data. This almost certainly leads to an over-estimate of the frequency of net pivotal events, as gentailers are expected to be net sellers of these products. The degree of over-estimation may be material, given that a sizeable volume of these contracts appears to exist. For example, contract disclosures indicate the volume of OTC hedge contracts in place has averaged around 500-600 MW over the last two years.

⁸⁶ The Reconciliation manager provided data on:

- the breakdowns of half-hourly and non-half-hourly retail load in each island in each month, by retailer; and
- the total half-hourly and non-half-hourly retail load in each island in each trading period.

These two datasets were combined to estimate the retail load of each retailer, in each island, in each trading period.

- B.3.16 The estimated half hourly contract positions were netted off against each major generator's generation capability, in order to determine whether they had a short term *incentive* to influence the price as well as the *ability* to do so.
- B.3.17 This information was used to estimate the amount of the time each gentailer was *net* pivotal. The results are summarised in Table 11.

Table 11 Estimated hours of net pivotal supply (and % of time)

Supplier	Estimate of time that supplier was net pivotal		
	NZ	North Island	South Island
Contact	1 (<1%)	61 (<1%)	0
Genesis	0	294.5 (1.1%)	0
Meridian	67.5 (3%)	0	10,269 (39%)
MRP	1.5 (<1%)	318.5 (1.2%)	0
All others	0	9 (<1%)	0
Total pivotal events	67.5 (3%)	425.5 (1.6%)	10,269 (39%)

- B.3.18 Subject to the caveats and assumptions outline above, Genesis, MRP and Contact were all occasionally net pivotal in the North Island (1.1%, 1.2% and <1% of the time respectively). On the very few occasions where (due to a supply shortfall) all suppliers in the North Island were gross pivotal, every *long* North Island supplier would also have been net pivotal.
- B.3.19 According to the results of this analysis, Meridian was very often (39% of the time) net pivotal in the South Island and sometimes (3% of the time) net pivotal nationally. Note that this result is considerably higher than the outcome of pivotal and net pivotal analysis undertaken by the Authority to support its market monitoring work. For this purpose, the Authority used a different technique and assumptions, employing the vSPD model and final pricing data to estimate Meridian's net trading position.

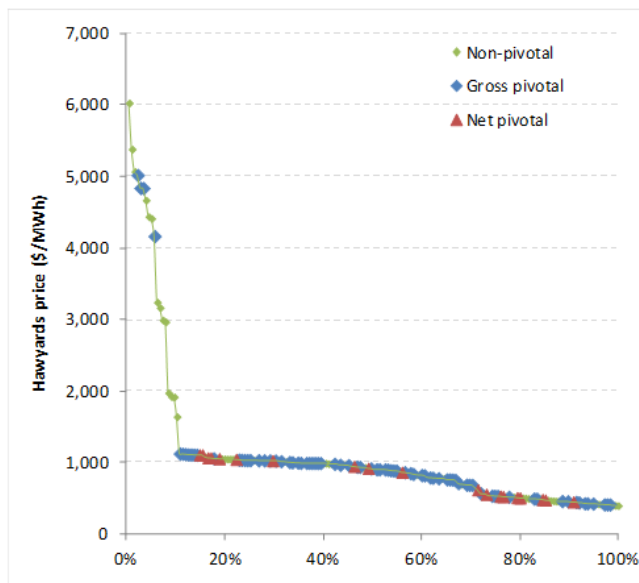
- B.3.20 The technique included altering Meridian's energy offers at or above a \$90/MWh threshold to \$20,000/MWh on the assumption that energy offers below this threshold would likely be sufficient to cover Meridian's retail and other contract positions in both islands. The result of this analysis for the period from 2009 to 2011 suggested Meridian would only have been able to unilaterally increase the South Island price < 1% of the time. The difference in results illustrates the degree to which they are prone to the assumptions employed to estimate data that is not readily available.

Observations based on analysis of historical data

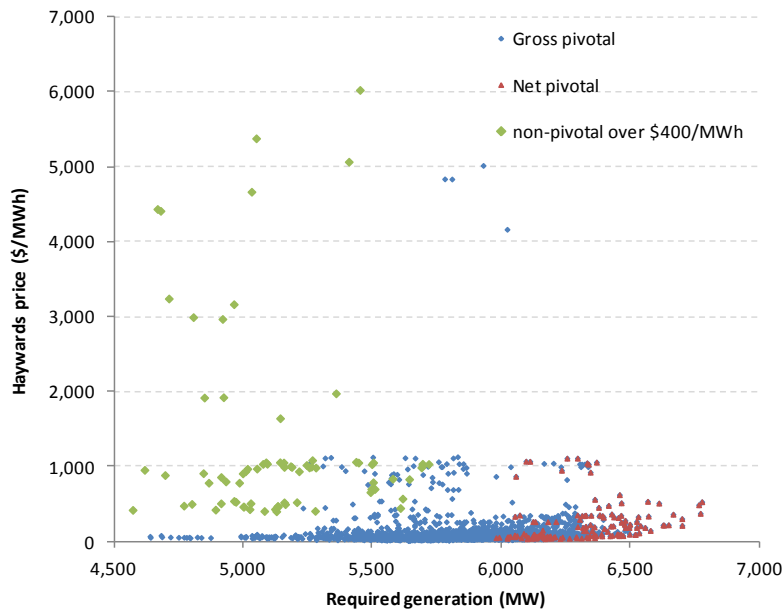
- B.3.21 The above analysis suggests that gross pivotal events are quite common. In fact, it suggests that in the South Island, Meridian was a gross pivotal supplier in a large proportion of trading periods, and net pivotal in over a third of all trading periods. This is unsurprising given Meridian's extensive South Island hydro portfolio (particularly considering that the Tekapo stations were controlled by Meridian and the virtual asset swaps had not yet taken effect for most of the modelled period).
- B.3.22 In the North Island, it is estimated that a supplier was gross pivotal in over 20% of trading periods. However, it is estimated that less than 2% of trading periods were subject to a net pivotal supplier in the North Island – and fewer still nationally. Looking ahead, it is likely that suppliers will be pivotal at an island level much less often once HVDC Pole 3 becomes available.
- B.3.23 Even in the trading periods where a party was pivotal, this does not necessarily indicate a cause for concern as there may not have been any offer behaviour that would lead to efficiency losses. Clearly, it is not feasible to assess each such trading period in detail to assess whether efficiency losses occurred. However, a broad assessment can be made by considering:
- (a) the extent to which high spot prices are associated with pivotal supply periods – the absence/presence of high prices in such periods would tend to reduce/increase the concern about potential efficiency losses
 - (b) if high spot prices are correlated with pivotal supply periods, are there are other factors which help to explain the patterns – e.g. are such periods associated with very high demand when the system is likely to be stressed.

- B.3.24 Figure 3 shows the top end of the Haywards price duration curve for 2009-2011 (spot prices above \$400/MWh). The figure highlights periods in which the analysis indicated there was a national gross pivotal situation or a national net pivotal situation.

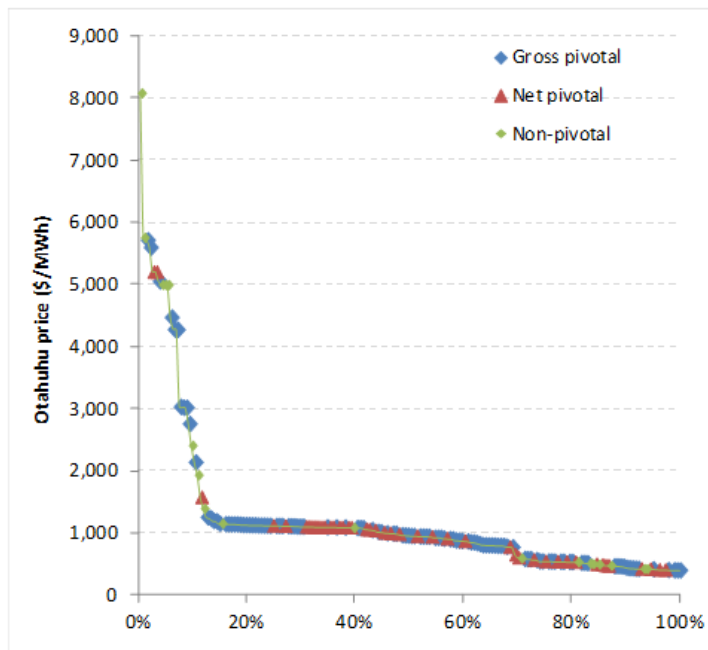
Figure 3 National price duration curve for prices above \$400



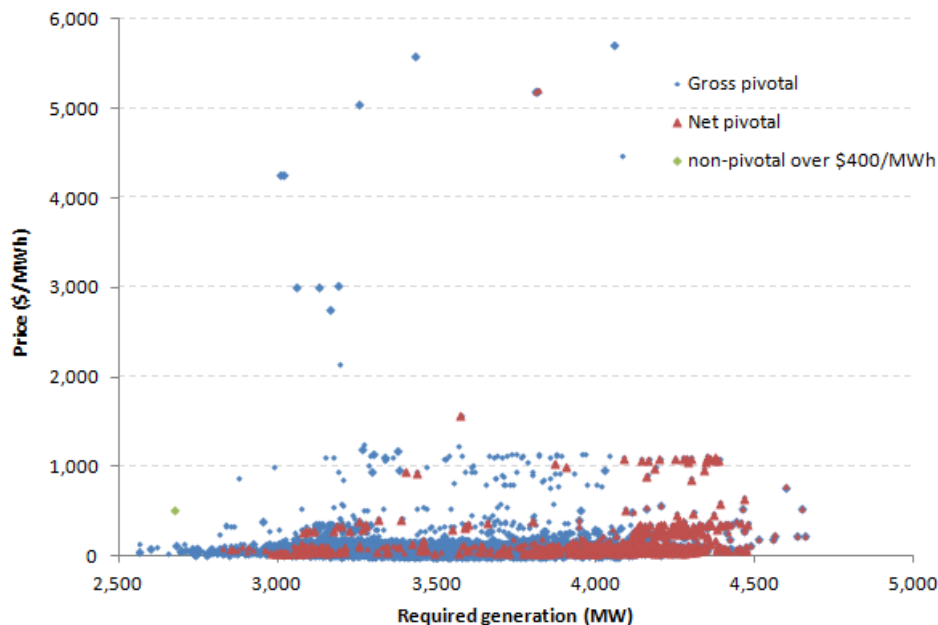
- B.3.25 The analysis suggests that very high spot prices (substantially over \$1000/MWh) were rarely associated with net pivotal supplier situations. On the other hand, there was often a net national pivotal situation when prices reached between \$400/MWh and \$1000/MWh.
- B.3.26 Figure 4 shows the correlation between the actual spot price at Haywards and the national load (including transmission losses). The graph shows all periods in which there is estimated to have been a national pivotal situation, *or* in which the spot price was at least \$400/MWh.

Figure 4 Distribution of national gross and net pivotal events

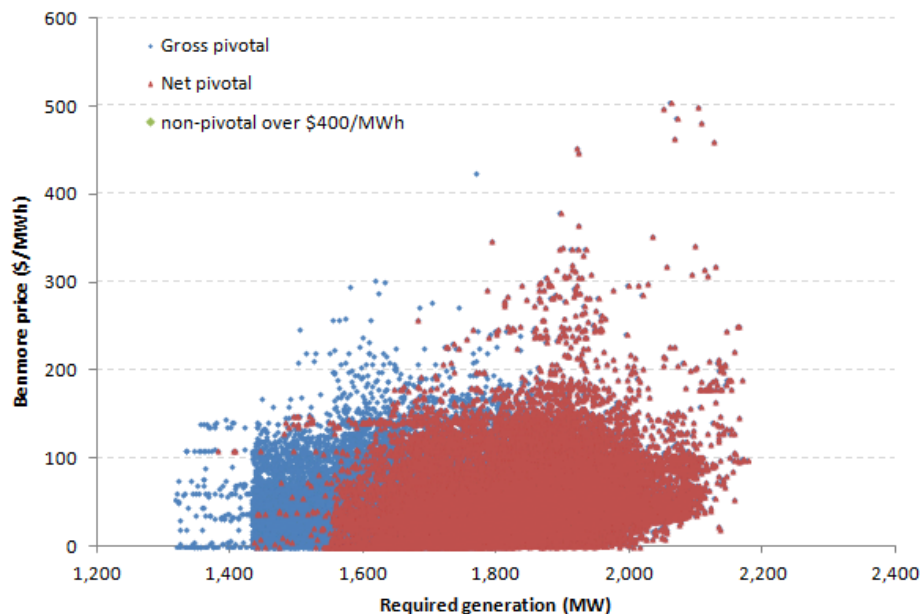
- B.3.27 It appears that national pivotal situations were more correlated with high *load* than with high *price*.
- B.3.28 The same results are shown for North Island pivotal situations.
- B.3.29 Figure 5 shows the top end of the Haywards price duration curve for 2009-2011, highlighting periods in which the analysis indicates there was a North Island gross pivotal situation or a North Island net pivotal situation.

Figure 5 North Island price duration curve for prices above \$400

- B.3.30 The great majority of periods in which the spot price was high at Haywards were associated with North Island gross (and in some cases net) pivotal situations.
- B.3.31 Figure 6 shows the correlation between the actual spot price at Haywards and North Island load (including an allowance for transmission losses). The graph shows all periods in which there is believed to have been a North Island pivotal situation, or in which the spot price was at least \$400/MWh.

Figure 6 Distribution of North Island gross and net pivotal events

- B.3.32 Unlike national pivotal situations, North Island pivotal situations were associated with a wide range of load levels. Further analysis shows that a supplier could be pivotal either:
- (a) as a result of very high island load
 - (b) as a result of generation and/or HVDC unavailability
 - (c) as a combination of both factors.
- B.3.33 Figure 6 also shows that there were many periods in which a supplier was pivotal in the North Island, but the spot price was *not* high.
- B.3.34 Figure 7 shows the correlation between the actual spot price at Benmore and South Island load (including an allowance for transmission losses). The graph shows all periods in which there is believed to have been a South Island pivotal situation, or in which the spot price was at least \$400/MWh.

Figure 7 Distribution of South Island gross and net pivotal events

- B.3.35 This shows that there were very few instances of very high prices in the South Island. Only ten periods had prices above \$400/MWh at Benmore, seven of which are associated with the weather bomb that hit the country in August 2011 (the cluster of data points in the top right).
- B.3.36 Neither gross nor net pivotal periods have typically been associated with high prices in the South Island.⁸⁷
- B.3.37 South Island pivotal situations have been strongly associated with high island load.
- B.3.38 Overall, the analysis shows that:
- (a) while Meridian may have had the ability and short-term incentive to increase South Island (and sometimes national) prices to high levels for much of 2009-11, it did not proceed to set the price to a very high level
 - (b) several parties may have had the ability and short-term incentive to increase North Island prices to high levels at some times during 2009-11. Indeed, prices have reached high levels (sometimes over \$400/MWh, occasionally over \$1000/MWh) during some North Island

⁸⁷ Benmore prices have typically been more closely associated with hydrology.

pivotal situations. Many high prices were associated with high island load and/or availability of major thermal generation – under such conditions, high prices are likely to be “explicable”. However, it is not clear that *all* such high prices were necessarily “explicable”.

B.4 Wider pivotal supplier situations – potential efficiency effects

- B.4.1 The historical analysis in the previous section does not provide clear evidence that suppliers have taken advantage of national or island-level pivotal situations to set the spot price to an inefficiently high level.
- B.4.2 The analysis does, however, show that national and island-level pivotal situations have been very frequent in the past. It would be reasonable to assume that even once HVDC Pole 3 becomes available, pivotal situations will still occur. This may provide scope for inefficiencies to arise in the future, given the fluid nature of offer behaviour. It is therefore important to consider the potential for effects to arise going forward.

Potential productive efficiency loss – wider pivotal supplier situations

- B.4.3 If pivotal suppliers caused (or were expected to cause) an increase in spot prices levels or volatility absent underlying physical scarcity, other participants would be likely to act to mitigate this action. Options include purchasing hedge, changing retail positions, arranging short term demand response, and/or constructing additional peaking generation.
- B.4.4 As with local pivotal supply situations, some thinning of retail competition could be expected as:
- (a) parties limited their retail operations in an island where they have limited or no ability to self-insure with generation
 - (b) parties limited their retail operations in parts of islands because of perceived within island locational price risk.
- B.4.5 The first of these effects should be mitigated to some extent by the forthcoming introduction of FTRs. However, exposure to pivotal supplier risk would not be entirely eliminated as parties will need to acquire FTRs via auctions and therefore face some uncertainty about cover. Furthermore, FTRs may not always provide full cover in situations where there is an extended transmission outage (because transmission flows and hence rental income to fund FTRs will be reduced). The second effect is a 'within-island' risk and will not be addressed by FTRs.
- B.4.6 In light of these factors, \$10-20 million or 50% of the benefit estimated from the introduction of FTRs (\$20-40 million PV) has been adopted as an estimated upper bound on the efficiency loss. However, there is clearly a significant degree of uncertainty associated with this estimate.

- B.4.7 More generally, with wider pivotal supplier risk there is an increased likelihood that this will lead to product efficiency losses through over-investment in generation, as limiting retail coverage is likely to be much less viable when considering price risk that affects very broad areas.
- B.4.8 As with local pivotal supplier risk, construction of additional back-up or peaking generation may be efficient if high prices reflect the marginal cost of supply and/or demand-side response at times of capacity scarcity. However, it is likely to be inefficient if the high prices are not associated with genuine scarcity, and merely reflect the value of withholding. Some degree of over-investment in peaking capacity might therefore occur.
- B.4.9 Estimates of the efficiency loss associated with different levels of over-investment have been derived from the security margins analysis carried out previously by the Authority.⁸⁸ The efficiency loss depends on:
- (a) the 'base case' capacity margin that would have been delivered by the market in the absence of over-investment (as shown in Table 12)
 - (b) the amount of over-investment that occurs in response to the risk of wider pivotal supplier situations.

Table 12 Efficiency loss associated with over-investment in peaking capacity

Base case Winter Capacity Margin (MW)	Winter Capacity Margin as a result of pivotal supplier situations (MW)	Efficiency loss (\$M/year)
700	800	4
800	900	9
900	1000	13

- B.4.10 The efficiency loss increases as the base case capacity margin increases, because the additional capacity delivers increasingly little benefit in terms of preventing genuine shortage.

⁸⁸ <http://www.ea.govt.nz/document/16959/download/our-work/consultations/sos/winter-energy-capacity-security-supply-standards/>

- B.4.11 A plausible upper bound on the efficiency loss stemming from over-investment in capacity at a national level is estimated at \$13 million per year (resulting from 100 MW of over-investment, starting from a base case Winter Capacity Margin of roughly 900 MW). A central case is estimated at \$4 million per year (resulting from 100 MW of over-investment, starting from a base case Winter Capacity Margin of roughly 700 MW). The lower bound would be zero (since purchasers might manage their risks in other ways). The range of productive efficiency losses is therefore estimated to be \$0-90 million over ten years when discounted at 8%.
- B.4.12 It should also be noted that if parties respond to increased price risk in pivotal supplier situations by investing in additional generation capacity, there is less likely to be a retail competition effect, and vice versa. For this reason, the productive efficiency loss estimates for generation and retail sector effects are not assumed to be additive.

Allocative efficiency losses – wider pivotal supplier situations

- B.4.13 It is possible that high prices during pivotal supplier situations (absent real shortages) will result in an increase in mean spot prices (though the increase is likely to be constrained by threat of new entry). Increases at the wholesale level are likely to be passed on to end consumers, resulting in some inefficient demand response.
- B.4.14 Table 9 (presented at paragraph B.2.17) set out the implied change in mean spot prices for a range of assumptions about the frequency of pivotal supplier situations and the level to which the spot price may be set during these situations. For local pivotal supplier situations, there is potential for average spot prices to increase to a higher level because the cost of the next best alternative to purchasers can be quite high (ultimately it may require new back-up generation for all affected load).
- B.4.15 By contrast, for wider pivotal supplier events there should be no need to provide back-up generation for all demand to mitigate price risk. Instead, a relatively small increment of supply is likely to be sufficient to mitigate this risk.
- B.4.16 Accordingly, for the purposes of this analysis, the price uplift scenarios are lower:
- (a) a *lower price uplift* scenario, in which 30 TWh of load experiences a \$2/MWh increase in mean price

(b) a *higher price uplift* scenario, in which 30 TWh of load experiences a \$5/MWh increase in mean price.

B.4.17 The *low price uplift* scenario is expected to result in a deadweight loss of \$0.15 million per year; the *high price uplift* scenario, a deadweight loss of \$0.9 million per year.⁸⁹ The range of allocative *efficiency* losses is therefore estimated at \$1 million to \$7 million over ten years when discounted at 8%.

Dynamic efficiency effects – wider pivotal supplier situations

- B.4.18 As noted earlier, dynamic efficiency refers to the process of innovation and investment, and one of the most important drivers for dynamic efficiency is the level of competition. Pivotal supplier situations have the potential to affect market dynamics. In particular, the New Zealand electricity market is characterised by a significant degree of vertical and horizontal integration. Parties that are buyers at one time or location can be pivotal suppliers at other times or locations. Parties with such dual interests may be in a better negotiating position with other pivotal suppliers (e.g. when purchasing hedge products) because of the potential for mutually beneficial trades.
- B.4.19 Conversely, smaller or non-integrated parties without any potential to be pivotal may have greater difficulty in managing spot price risk and in buying hedge cover on acceptable terms. These effects could inhibit entry or expansion by such participants and weaken competition. Given that these parties can be expected to have less interest in preserving existing industry structures and processes (as compared to established players), they can represent an important source of new ideas and competitive pressure.
- B.4.20 Measuring dynamic efficiency losses is typically harder than measuring productive or allocative losses because they are less directly observable. However, dynamic efficiency is almost universally regarded as being the most important form of efficiency.
- B.4.21 While quantifying dynamic efficiency benefits is challenging, competition authorities are frequently called upon to make such assessments. Typically, they use one of the following approaches to estimate efficiency effects:
- (a) estimating the change in consumer surplus from an outward shift of the demand curve; this approach seeks to measure the increase in product innovation (but not process innovation)

⁸⁹ Using the same assumptions for price elasticity of demand as for local pivotal supplier situations.

- (b) multiplying the combined allocative and productive inefficiency improvements by a factor on the basis that dynamic efficiency consequences are likely to be greater than allocative and productive efficiencies
- (c) multiplying total revenue by a factor estimated from qualitative information.

- B.4.22 The first approach is less suitable in the current context because it primarily attempts to measure the effects of product innovation. In the current context, changes in direct product innovation are less likely to be the main source of dynamic efficiency effects. Rather, innovation is more likely to occur around the practice, processes and systems used within the industry. Nor is the second approach especially relevant in the current context because it is not clear what multiple of productive and allocation effects should be applied.
- B.4.23 This paper therefore applies the third approach; multiplying a sector revenue baseline by a factor estimated from qualitative information. This was the approach taken for the assessment of transmission pricing. Two key judgments are required: the choice of revenue base and the choice of efficiency factor.
- B.4.24 Because pivotal supplier risk is likely to impact principally at the wholesale level, the wholesale market revenue has been used as the baseline. Arguably, this is conservative, because wholesale market effects will ultimately ripple through the value chain and affect the retail market as well.
- B.4.25 Efficiency factors of between 0.25% and 0.5% have been applied in this analysis.⁹⁰ These have been estimated by reference to the factors used in other analyses of market efficiency effects.
- B.4.26 The efficiency factors used by the Commerce Commission in the Air New Zealand and Ravensdown decisions, ranged between 0.5% and 1.5%.⁹¹ These were used to estimate potential dynamic efficiency impacts from a proposed strategic alliance and acquisition respectively. In the Cavalier Corporation decision (a proposed acquisition), the Commission used 0% to

⁹⁰ Another point of comparison is the efficiency factor used in the Authority's assessment of transmission pricing methodology which was 0.3%.

⁹¹ See http://www.comcom.govt.nz/assets/Imported-from-old-site/PublicRegisters/ContentFiles/Documents/310886_1.pdf (particularly paragraph 1181).

1%, with a mid-point of 0.5% as the most likely effect, but considered that dynamic efficiency may be very limited in this instance.⁹² All three decisions were appealed to the High Court, which upheld the Commission's approach in each case.

- B.4.27 The dynamic efficiency losses of pivotal supplier situations are expected to be lower than the dynamic efficiency impacts of strategic alliances and acquisitions, as pivotal supplier situations are unlikely to have as great an impact on confidence.
- B.4.28 Using efficiency factors of between 0.25% and 0.5%, the potential dynamic efficiency effect is estimated at between \$60 million and \$120 million.
- B.4.29 A weakening of competition is also the underlying trigger for efficiency concerns in the current context. However, rather than coming about through an alliance or acquisition, the competition concern arises because of the potential for exposure to pivotal supplier risk to weaken competition over time.
- B.4.30 In this context, it may be useful to consider a scenario where offers by pivotal suppliers (absent actual scarcity) were much higher than in the past (say \$50,000/MWh, noting that an even higher offer price was recorded during a non-pivotal supply event in the recent past). If a party was exposed to prices at this level for just one hour, it would experience an increase in annual purchase costs of 8%.⁹³ If the party was exposed for ten hours, it would experience an increase in annual costs of over 40%. Clearly, there would be very significant step up in risk and this would be likely to present a significant hurdle to parties considering market entry or expansion, except for those few parties with pivotal supplier capability. Indeed, even among those parties, there are differing levels of strength, and some reduction in competition could be expected as suppliers reduced their areas where vulnerability to price risk is lower. In short, while the mechanism is different from business alliances or partial industry consolidation (which fall under the Commerce Act), a situation of unrestrained pivotal supplier risk could have similar types of competitive effect over time.

⁹² See <http://www.comcom.govt.nz/assets/Uploads/PUBLIC-Decision-725-Cavalier-Wool-Holdings-New-Zealand-Wool-Services-updated-28-Sep-2011.pdf> (particularly paragraphs 310-311).

⁹³ Assuming average costs at other times was \$65/MWh.

B.5 Other analysis of wider pivotal supplier situations

- B.5.1 Some analysis of wider pivotal supplier situations has been undertaken in the past. In particular, a study into spot price outcomes between 2001 and 2007 was undertaken by Professor Wolak for the Commerce Commission.⁹⁴ It calculated a 'competitive benchmark price' for each trading period and compared this to observed spot price outcomes. It concluded that generators had been net pivotal at times between 2001 and 2007 (especially during dry periods), and had exercised market power to raise spot prices, and generated market rents of \$4.3 billion in that period (i.e. the revenue accruing at prices above the calculated competitive benchmarks).
- B.5.2 While the findings regarding the frequency of pivotal supplier situations were generally uncontested, a number of commentators expressed significant reservations about the size of the market rent estimate calculated in the study. For example, the University of Auckland Energy Centre and Electric Power Optimization Centre (EPOC) in a joint paper commented that "we disagree with Professor Wolak's assumptions in calculating market rents in dry years. In his report, Professor Wolak has chosen competitive benchmarks in which either hydro-electricity dispatches are fixed, or the opportunity cost of water is set equal to the marginal cost of the highest cost thermal generator. [...] However, in the New Zealand setting, we believe this is incorrect, because it ignores New Zealand's likelihood and resulting costs of running out of water".⁹⁵
- B.5.3 Reservations were also expressed by some other commentators in relation to the following:⁹⁶
- The potential underestimation of the availability and opportunity cost of gas particularly in the light of the decline of the Maui gas field, as well as thermal generation costs generally

⁹⁴ 'An assessment of market power in the New Zealand wholesale electricity market', Frank A. Wolak, Stanford University, 2009. Report prepared for the New Zealand Commerce Commission

⁹⁵ 'A Response to the Wolak Report', Energy Centre and Electric Power Optimization Centre, University of Auckland, 25th May 2009

⁹⁶ For a summary, see www.med.govt.nz/sectors-industries/energy/pdf-docs-library/electricity-market/implementing-the-electricity-market-review-recommendations/background-papers-on-2009-review/improving-electricity-market-performance-volume-one-discussion-document-1152-kb-pdf.pdf

- The assumption of ‘perfect foresight’ in calculating the competitive benchmark price, with no apparent allowance for the uncertainties that parties face in the real world about factors such as demand, plant reliability and hydro inflows
- The use of actual demand to estimate the competitive benchmark price in dry years, without any recognition that demand response had occurred in those periods which had a cost.

- B.5.4 Critics argued that these factors meant that the competitive benchmark price was underestimated. Indeed, some pointed out that an average of the calculated benchmark prices over the seven year study period was insufficient to cover the costs of building new capacity and ensuring security of supply. The Commerce Commission itself stated “The Commission recognises that a mechanism designed to create additional incentives to invest and so meet the adequacy of supply issue would come at an additional cost to consumers over competitive wholesale prices.”⁹⁷
- B.5.5 More recently, the WAG is aware of work by EPOC to compare observed market outcomes over the period 2005-2008 against a cost-minimising benchmark incorporating a degree of risk aversion by a central planner. EPOC is yet to complete and publish this work, but draft results were presented to the WAG in March 2013.⁹⁸ This work assessed a different period to that covered by Professor Wolak’s analysis, but where the periods overlapped it found similar levels of market rents to those estimated by Professor Wolak.
- B.5.6 In light of this more recent analysis, EPOC commented that its results indicate that “there is something going on here that needs attention”.⁹⁹ However, EPOC also noted that a risk-averse central planning benchmark may not be the most appropriate yardstick for assessing market outcomes. Without a suitable counterfactual, EPOC suggests it is “very difficult to tell” if the Electricity Act resulted in a competitive spot market.¹⁰⁰

⁹⁷ ‘Investigation Report Commerce Act 1986 s27, s30 and s36 Electricity Investigation’; 21 May 2009; paragraph 689

⁹⁸ ‘Pivotal pricing, price caps and efficiency’ Andy Philpott, Electric Power Optimization Centre, University of Auckland, WAG presentation, March 14, 2013

⁹⁹ Ibid.

¹⁰⁰ Ibid.

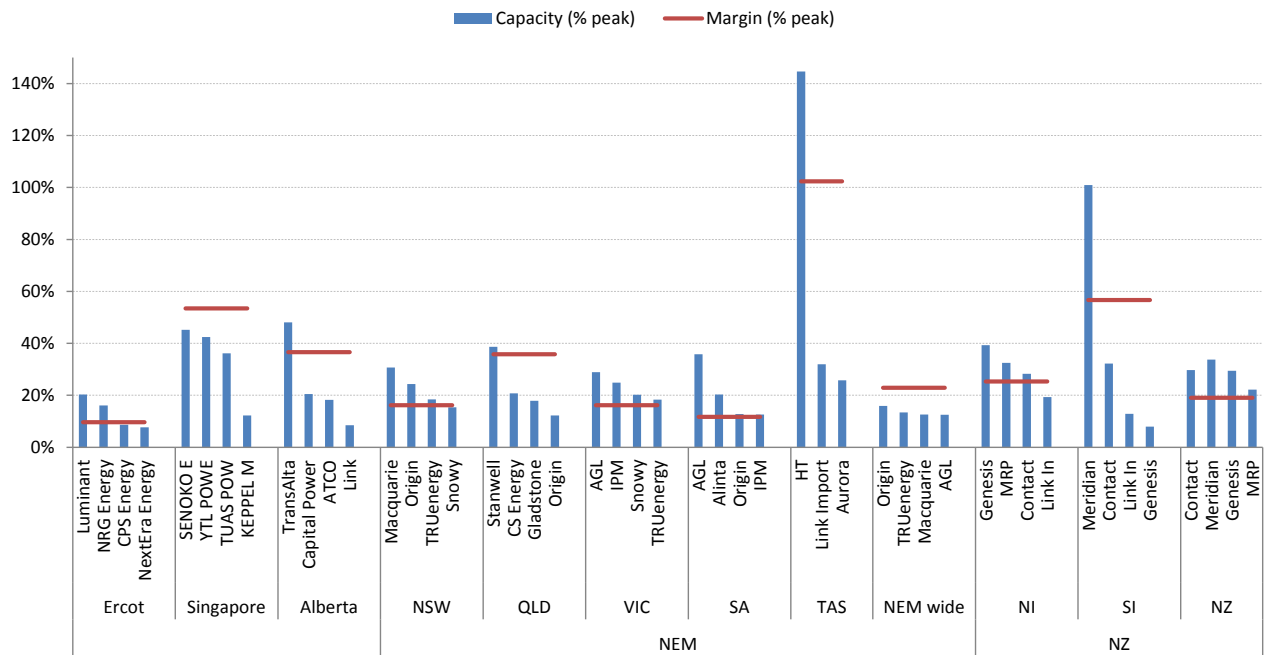
B.6 Comparison with international data for energy only markets

- B.6.1 Another potentially useful point when assessing the significance of widespread pivotal supply events is to compare the New Zealand position with other energy-only markets (i.e. those markets with no separate capacity mechanism).¹⁰¹
- B.6.2 Figure 8 shows a comparison of system margin at times of peak demand and the capacity shares of the main suppliers for each of these markets. If a supplier has a capacity share which exceeds the system margin, then it would be expected to be pivotal at the time of peak demand.
- B.6.3 This analysis indicates that the degree to which suppliers are pivotal in New Zealand and in the North Island is broadly comparable with the position in Texas (ERCOT), Alberta and four regions of the Australian National Electricity Market (NEM). It also indicates the degree of pivotal supply in the South Island is significantly greater than most other regions/markets, except for the Tasmanian region of the NEM.

¹⁰¹ The following assumptions and caveats apply:

- the analysis seeks to include losses and operating reserves (estimates have been made for some overseas jurisdictions)
- peak demand data may not be entirely consistent. For example NZ peak demand is at GXP level and from the system operator's 2012 annual security assessment. Peak demand data for other regions is historical and may not treat embedded generation on the same basis
- Transmission constraints within regions are ignored. Inter-regional links are treated as 'supply capacity' within the given region, based on rated import capacity
- Demand response is assumed to be already built into peak demand data
- Units are allocated to suppliers based on ownership (or plant-based contracts where they exist as in the NEM) and are assumed to be available and committed, except wind which is de-rated to 25% of nameplate capacity

Figure 8 Comparison of system margin at times of peak demand and capacity shares of main suppliers



Appendix C Commerce Act and pivotal supplier situations

C.1 Introduction

- C.1.1 The Commerce Act is unlikely be effective in addressing most pivotal supplier situations as it would require either:
- (a) the *coordinated action* of two or more parties; or
 - (b) a pivotal supplier acting with a clear anti-competitive *purpose* beyond simply raising prices.
- C.1.2 This appendix summarises sections of the Commerce Act that may be relevant to pivotal supplier situations.

C.2 Section 27 – entering into a contract, arrangement or understanding that substantially lessens competition in a market

- C.2.1 Section 27 of the Commerce Act provides that:¹⁰²
- (1) No person shall enter into a contract or arrangement, or arrive at an understanding, containing a provision that has the purpose, or has or is likely to have the effect, of substantially lessening competition in a market.
 - (2) No person shall give effect to a provision of a contract, arrangement, or understanding that has the purpose, or has or is likely to have the effect, of substantially lessening competition in a market.
- C.2.2 Section 27 will only be breached if there is a contract, arrangement, or understanding between two or more persons that has the purpose, effect, or likely effect of substantially lessening competition in a market. The meaning of the term contract is clear: an agreement that is enforceable at law. The inclusion of arrangements and understandings means that a formal written agreement is not required: an arrangement or understanding can be as informal as a 'wink or a nod'. The key criterion, however, is that there is a meeting of minds among the parties that embodies an expectation as to the future conduct of at least one of the parties.
- C.2.3 Where a pivotal supplier situation arises because of one person's actions, it would fall outside section 27. It is only where a pivotal situation arises

¹⁰² The Commerce Act is available at:
<http://www.legislation.govt.nz/act/public/1986/0005/latest/DLM88263.html>

because of a contract, understanding or arrangement between two or more persons that section 27 could apply. It seems unlikely in most instances that a pivotal supplier situation would arise as a result of an arrangement between two or more persons, because such situations generally arise as a result of the unilateral behaviour of one participant. This means section 27 is not an effective means of addressing concerns about pivotal supplier situations that arise because of one person's action, which is of primary relevance.

C.3 Section 36 – taking advantage of market power

C.3.1 Section 36(2) of the Commerce Act provides that:

“A person that has a substantial degree of power in a market must not take advantage of that power for the purpose of—

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

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

(c) eliminating a person from that or any other market.”

C.3.2 This means it is not illegal for a business to have a substantial degree of market power. Nor are high prices in themselves illegal. For section 36 to apply, three elements must be established:

(a) a party must have a substantial degree of power in a market;

(b) that party must take advantage of that power; and

(c) the purpose of that party taking advantage of its power must be to:

(i) restrict the entry of a person into that or any other market;

(ii) prevent or deter a person from engaging in competitive conduct in that or any other market; or

(iii) eliminate a person from that or any other market.

C.3.3 In some pivotal supplier situations, subparagraph (a) is likely to be established. The relevant market is likely to be defined as the national wholesale market for the supply and purchase of electricity (although the geographical dimension of the market could be defined more narrowly in some situations).

- C.3.4 In the Commerce Commission's Electricity Investigation Report (May 2009),¹⁰³ the Commission expressed its view that the major generators each have had the ability and incentive to exercise unilateral market power in the wholesale market, and that the frequent and repeated nature of the market power observed suggest it is recurring in nature (and cannot be described as merely temporary or transitory). The Commission therefore concluded that the generators are likely to have held market power, and to have exercised a substantial degree of market power on a recurring basis for significant periods, in the national wholesale electricity market.
- C.3.5 However, unless a generator has taken advantage of its market power for one of the proscribed purposes in subparagraph(c), it will not breach section 36. In assessing whether an entity has taken advantage of its market power, it is necessary to consider whether the entity would act in the same way in a competitive market (i.e. a market in which it does not have market power). Establishing a breach of section 36 may therefore be difficult, as it may be that the generator would have acted in the same way in a hypothetically competitive market.
- C.3.6 Further, even if a generator was found to have taken advantage of its market power, for section 36 to apply it would be necessary to establish that the generator had acted for one of the proscribed purposes (i.e. to restrict entry into a market, prevent or deter a person from engaging in competitive conduct, or eliminate a person from a market). In many pivotal supplier situations, a pivotal generator may not have one of the proscribed purposes and could have perfectly legal commercial motivations for offering high prices.
- C.3.7 The high threshold for establishing a breach of section 36 means that the situations in which it will prohibit pivotal supplier situations may be limited (depending on the actual facts of each situation).

C.4 Section 58 – authorisations

- C.4.1 Section 58(1) and (2) of the Commerce Act allows a person to seek an authorisation from the Commerce Commission to enter into or give effect to an arrangement to which that person considers section 27 of the Commerce Act would apply. Section 61(6) of the Commerce Act prevents

¹⁰³ <http://www.comcom.govt.nz/assets/Business-Competition/Enforcement-Outcomes/Electricity-Investigation-FINAL-PUBLIC-PDF-Investigation-Report-21-May-2009.pdf>.

the Commerce Commission from granting an authorisation unless under section 58 unless it is satisfied that the public benefits will, or are likely to, outweigh the competitive detriments.

- C.4.2 Authorisation is not available for taking advantage of market power under section 36 of the Commerce Act.

C.5 The Commerce Act is not a complete solution

- C.5.1 In summary, section 27 of the Commerce Act is unlikely to apply to a pivotal supplier situation, unless the pivotal supplier situation arises because a contract, understanding or arrangement has been entered into between two or more persons that has the purpose, effect, or likely effect of substantially lessening competition in a market.
- C.5.2 The high threshold for establishing a breach of section 36 means that the situations in which it will prohibit pivotal supplier situations may be limited.
- C.5.3 This means that the Commerce Act is unlikely to be an effective option for addressing pivotal supplier situations in the wholesale market.

Appendix D Conduct provisions in other markets

- D.1.1 Conduct provisions exist in many other wholesale electricity markets. In some markets these conduct provisions are quite general (for example, in the Australian NEM), while in other markets the conduct provisions explicitly prohibit market manipulation or abuse of a dominant position (for example, the regulation on wholesale energy market integrity and transparency (REMIT) in Europe and the Singapore Electricity Act which prohibits abuse of a dominant position in the wholesale and retail electricity markets). Conduct provisions also exist in other markets such as stock exchanges.
- D.1.2 Table 13 summarises the conduct provisions that exist in other relevant markets. Note that in some markets more than one conduct provision exists.

Table 13 Conduct provisions in other markets

Market	Summary of conduct provision
Type of conduct provision: prohibition of fraudulent or deceitful behaviour	
USA energy markets	The Federal Energy Regulatory Commission (FERC) has power to enforce market behaviour rules in the wholesale natural gas and electricity markets in the USA under the Code of Federal Regulations (CFR). The CFR prohibits fraudulent and deceitful behaviour: “(a) It shall be unlawful for any entity, directly or indirectly, in connection with the purchase or sale of electric energy or the purchase or sale of transmission services subject to the jurisdiction of the Commission, (1) To use or employ any device, scheme, or artifice to defraud, (2) To make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or

	(3) To engage in any act, practice, or course of business that operates or would operate as a fraud or deceit upon any entity.”¹⁰⁴ Under the Commodity Exchange Act the Commodity Futures Trading Commission has a role in prohibiting manipulation and fraud in connection with any swap or contract of sale of any commodity in the USA.¹⁰⁵
Type of conduct provision: prohibition of abuse of dominant position or market manipulation	
NZX markets	The Participant Rules for NZX markets prohibit market manipulation. According to NZX’s guidance note on market manipulation,¹⁰⁶ the rule on market manipulation is concerned with preventing manipulative trading which is done “with an intention of, or in a manner that has the effect, or is likely to have the effect of, creating a false or misleading appearance of active trading in any Securities or with the respect to the market for, or the price/yield of any Securities”.
Singapore wholesale electricity market	In Singapore the Electricity Act prohibits “any conduct... which amounts to the abuse of a dominant position in any wholesale electricity market”¹⁰⁷ and states that: “(2) Conduct may, in particular, constitute such an abuse if it consists of — (a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions of electricity in Singapore;

¹⁰⁴ Section 1c.2, of Title 18, Code of Federal Regulations: <http://www.ecfr.gov/cgi-bin/ECFR?page=browse>

¹⁰⁵ More information on the Commodity Futures Trading Commission role in anti-manipulation can be found here: http://www.cftc.gov/ucm/groups/public/@newsroom/documents/file/amaf_factsheet_final.pdf

¹⁰⁶ Guidance Note GN0015/08 – Market Manipulation: https://www.nzx.com/files/static/GN001508_Market_Manipulation_April11.pdf

¹⁰⁷ Section 51 of the Singapore Electricity Act: <http://www.ema.gov.sg/page/58/id:127/>

	(b) limiting generation of electricity, any wholesale electricity market, the retail electricity market or technical development in the electricity industry in Singapore to the prejudice of consumers; (c) applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage; or (d) making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.”¹⁰⁸
Europe wholesale energy markets	In Europe the regulation on wholesale energy market integrity and transparency (REMIT) prohibits “any engagement in, or attempt to engage in, market manipulation on wholesale energy markets”¹⁰⁹. Under REMIT, market manipulation includes: “(a) entering into any transaction or issuing any order to trade in wholesale energy products which: (i) gives, or is likely to give, false or misleading signals as to the supply of, demand for, or price of wholesale energy products; (ii) secures or attempts to secure, by a person, or persons acting in collaboration, the price of one or several wholesale energy products at an artificial level, unless the person who entered into the transaction or issued the order to trade establishes that his reasons for doing so are legitimate and that that transaction or order to trade conforms to accepted market practices on the wholesale energy market concerned; or (iii) employs or attempts to employ a fictitious device or

¹⁰⁸ Section 51 of the Singapore Electricity Act

¹⁰⁹ Article 5 of REMIT: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:326:0001:0016:EN:PDF>

	any other form of deception or contrivance which gives, or is likely to give, false or misleading signals regarding the supply of, demand for, or price of wholesale energy products; or (b) disseminating information through the media, including the internet, or by any other means, which gives, or is likely to give, false or misleading signals as to the supply of, demand for, or price of wholesale energy products, including the dissemination of rumours and false or misleading news, where the disseminating person knew, or ought to have known, that the information was false or misleading.”¹¹⁰
Nord Pool Spot physical markets	Nord Pool Spot prohibits market manipulation in its physical markets. Nord Pool Spot defines market manipulation to mean: (a) Transactions or Orders to trade: “(i) which give, or are likely to give, false or misleading signals as to the supply of, demand for or price of a Listed Product; or (ii) which secure, by a person, or persons acting in collaboration, the price of one or several Products at an abnormal or artificial level; unless the person who entered into the transactions or issued the orders to trade establishes that his reasons for so doing are legitimate and that these transactions or orders to trade conform to accepted market practices as specified in section 3 unterhalb; or (b) Transactions or Orders to trade which employ fictitious devices or any other form of deception or contrivance; or (c) Dissemination of information through the media,

¹¹⁰ Article 2, definition 2 of REMIT.

	including the Internet, or by any other means, which gives, or is likely to give, false or misleading signals as to Listed Products, including the dissemination of rumours and false or misleading news, where the person who made the dissemination knew, or ought to have known, that the information was false or misleading.” ¹¹¹
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Type of conduct provision: positive requirement(s) to act in good faith or observe high standards of conduct

Australian NEM	Australia’s NER require that dispatch offers must be made in “good faith”.¹¹² The NER defines that a dispatch offer is taken to be made in good faith if: “... at the time of making such an offer,... a <i>Scheduled Generator, Semi-Scheduled Generator or Market Participant</i> has a genuine intention to honour that offer... if the material conditions and circumstances upon which the offer... were based remain unchanged until the relevant <i>dispatch interval</i>.”¹¹³ The Australian Energy Regulator (AER) has questioned the effectiveness of the good faith provision in the NER and noted that it may need review.¹¹⁴ This follows the conclusion of a court case in which AER’s case that Stanwell Corporation Limited (Stanwell) had breached the good faith provision was dismissed.¹¹⁵ The AER had alleged that Stanwell had breached the good faith provision in relation to eight rebids made on 22
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¹¹¹ Nord Pool Spot Market, Trading Appendix 8 – Market Conduct Rules, Enclosure 1 – Definition of market manipulation, clause 1.1.

¹¹² NER, Rule 3.8.22A(a): <http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html>.

¹¹³ NER, Rule 3.8.22A(b).

¹¹⁴ Page 15 of AER, *State of the Energy Market Report 2011*. Available at: <Y:\Information Resources\Australia\AER - State of the energy market 2011.pdf>

¹¹⁵ The judgement can be found at: [http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/cth/FCA/2011/991.html?stem=0&synonyms=0&query=title\(stanwell%20\)#_Ref301973576](http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/cth/FCA/2011/991.html?stem=0&synonyms=0&query=title(stanwell%20)#_Ref301973576)

	and 23 February 2008, where dispatch prices increased from less than \$100 to over \$9000. ¹¹⁶
NZX markets	The Participant Rules for NZX markets require market participants to “observe proper ethical standards and act with honesty, integrity, fairness, due skill and care, diligence and efficiency”,¹¹⁷ and to “refrain from any action, conduct, matter or thing which is, or is reasonably likely to be, detrimental to the wellbeing or proper conduct of NZX, any of its markets and/or any Market Participant or Advisor”.¹¹⁸ In addition, NZX market participants must observe “good broking practice”, which is defined to be: “...conduct that is, at the discretion of NZX, in the wider interests of the markets provided by NZX, the New Zealand Securities markets and investors and which complies with the spirit and intent of the practices, procedures and requirements as by NZX in: (a) these Rules; and (b) the Procedures, any Guidance Notes, Practice Notes, documents, policy statement or direction issued from time to time by NZX; and (c) for the avoidance of doubt, common industry practices and/or historical practices, especially in areas where no policy statement has been issued by NZX, do not necessarily constitute Good Broking Practice.”¹¹⁹

¹¹⁶ There is no universally accepted definition of the term ‘good faith’. However, there is judicial and academic support for a concept of good faith that encapsulates cooperative, honest and reasonable conduct (page 101, Bayley JE (2009), ‘A doctrine of good faith in New Zealand contractual relationships’: <http://ir.canterbury.ac.nz/handle/10092/2862>). This concept of good faith is not entirely applicable to conduct provisions for a market as cooperation between market participants could lead to non-competitive outcomes.

¹¹⁷ Rule 8.1.1(a) of the NZX Participant Rules: <https://www.nzx.com/market-supervision/rules/nzx-participant-rules>.

¹¹⁸ Rule 8.1.1(b) of the NZX Participant Rules.

¹¹⁹ Rule 1.1 of the NZX Participant Rules.

Nord Pool Spot physical markets	The Market Conduct Rules for Nord Pool Spot's physical markets have a general conduct provision which requires that "Members must not apply unreasonable business methods when carrying out Trading, but always seek to act in accordance with good business conduct".¹²⁰ Nord Pool Spot do not define what is meant by "unreasonable business methods" or "good business conduct". Nord Pool Spot also has Ethical Guidelines to supplement the Rules (of which the Market Conduct Rules are a subset) that are expected to contribute to maintaining confidence in the market. However, the Ethical Guidelines have no standing in law. The Ethical Guidelines include provisions that: (a) all transactions "be performed with a genuine and generally acceptable business purpose";¹²¹ (b) "sudden changes in market behaviour that is not motivated by serious commercial or technical circumstances must not occur";¹²² and (c) "any Participant... that is a leading player in respect to the relevant supply or demand for electricity derivatives must assure that they do not in any inconsiderate way affect the price development in the relevant markets".¹²³
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¹²⁰ Nord Pool Spot Market, Trading Appendix 8 – Market Conduct Rules, rule 5.1
<http://www.nordpoolspot.com/PageFiles/rulebook/MARket%20Conduct%20Rules.pdf>.

¹²¹ Nord Pool Ethical Guidelines, clause 6.1:
http://www.nordpoolspot.com/Global/Download%20Center/Rules-and-regulations/trading-appendix_7_ethical-guidelines.pdf.

¹²² *Ibid.*, clause 6.3.

¹²³ *Ibid.*, clause 6.4.

Appendix E Possible conduct provisions for the Code based on NZEM/MARIA provisions

Conduct provision in the NZEM / MARIA Rules	Possible conduct provision for the Code
<u>NZEM Rule 1.6.3, Part 1:</u> “A Market Participant or service provider must... observe high standards of trading conduct” <u>MARIA Rule 1.4</u> “Participants must at all times ... maintain high standards of integrity and fair dealing”	The following clause be added to the Code as clause 13.5A:¹²⁴ A participant must observe high standards of trading conduct. <i>(NZEM form)</i> or A participant must at all times maintain high standards of integrity and fair dealing. <i>(MARIA form)</i>
<u>NZEM Rule 2.35, Part 1:</u> <u>“an ‘Undesirable Situation’ means any situation which threatens or may threaten fair, orderly or proper trading on the NZEM, and without limiting the generality of the foregoing, includes the occurrence, threat or possible threat of: [..] Manipulative or attempted manipulative activity”</u>	The following clause be added to the Code as clause 13.5A:¹²⁵ A participant must not engage in <u>manipulative or attempted manipulative activity</u> <i>(modelled on wording from NZEM Undesirable Situation definition)</i>
<u>NZEM Rule 2.4.6, Part 1:</u> “The functions of the Market Surveillance Committee shall be	No amendment to Code is required. Under section 25(a)(i) of the Act the Rulings Panel is “to assist in the

¹²⁴ Part 13 of the Code deals with trading arrangements.

¹²⁵ Part 13 of the Code deals with trading arrangements.

Conduct provision in the NZEM / MARIA Rules	Possible conduct provision for the Code
to... investigate all allegations of misconduct, or suspected breaches of these rules, by Market Participants, service providers or the Market Administrator and investigate all complaints by clients or members of the public against Market Participants, service providers or the Market Administrator" <u>MARIA Rule 5.2</u> Sets out similar provisions for the MARIA Conduct Committee	enforcement of the Code by hearing and determining complaints about breaches or possible breaches of the Code".
<u>NZEM Rule 2.23.3, Part 1:</u>¹²⁶ "The Market Surveillance Committee may at any time terminate or suspend all or any of a Market Participant's trading rights by making a termination order or a suspension order in any case where, in the opinion of the Committee, a Market Participant... is guilty of misconduct in carrying on its business" <u>MARIA Rule 5.11</u> Sets out similar powers for the MARIA Conduct Committee	The WAG considers that no amendment to Code is required. Section 54 of the Act lists nine actions that the Rulings Panel can take when they have determined that a participant has breached the Code.
<u>NZEM Rule 2.64, Part 2, Section B:</u> "In relation to the generation plant	Clause 13.9(b) of the Code be amended as follows:¹²⁷

¹²⁶ As recorded in the June 2002 version of the NZEM Rules. In some earlier versions of the NZEM Rules it was rule 2.22.3, Part 1.

Conduct provision in the NZEM / MARIA Rules	Possible conduct provision for the Code
that is the subject of the offer, not exceed, for each price band, the Generator Class Market Participant's reasonable estimate of the quantity of Electricity capable of being supplied at that grid injection point by that generation plant given the price in that band." <u>MARIA Rules</u> No similar rule existed in MARIA because trading took place on a bilateral basis	Each offer submitted by a generator must in relation to the generating plant that is the subject of the offer, not exceed, <u>for each price band and for each trading period</u>, the generator's reasonable estimate of the quantity of electricity capable of being supplied at that grid injection point by the relevant generating plant for the relevant trading period <u>given the price in the band</u>;

¹²⁷ Proposed additions to the clause are underlined.

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
ACER	Agency for Cooperation of Energy Regulators (European Union)
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
Authority	Electricity Authority
CFR	Code of Federal Regulations (U.S.A)
Code	Electricity Industry Participation Code 2010
EGR	Electricity Governance Rules
FERC	Federal Energy Regulatory Commission (U.S.A)
HVDC	High Voltage Direct Current link between South and North islands
kW	Kilo Watt
MARIA	Metering and Reconciliation Information Agreement
MSC	Market Surveillance Committee under the NZEM Rules
MWh	Mega Watt hour
NEM	Australian National Electricity Market
NER	Australia's National Electricity Rules
Net Pivotal	A generator is <i>net pivotal</i> when some or all of its generation is needed to meet demand in a region and the generation needed exceeds the generator's own retail and hedge commitments in that region
NZEM	New Zealand Electricity Market
NZX	New Zealand Exchange
OCGT	Open cycle gas turbine
Pivotal	A generator is <i>pivotal</i> when some or all of its generation is needed to meet demand in a region
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency (European Union)

Reserve	Instantaneous reserve
SEM	Single Electricity Market (of island of Ireland)
TPS test	Three Pivotal Supplier test
UTS	Undesirable Trading Situation
WAG	Wholesale Advisory Group

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