

Claimed undesirable trading situation, 26 March 2011

Toby Stevenson

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About Sapere Research Group Limited

Sapere Research Group is one of the largest expert consulting firms in Australasia and a leader in provision of independent economic, forensic accounting and public policy services. Sapere provides independent expert testimony, strategic advisory services, data analytics and other advice to Australasia's private sector corporate clients, major law firms, government agencies, and regulatory bodies.

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Introduction

Experience and qualifications

1. My full name is Toby William Stevenson. I am a Director of Sapere Research Group (formerly LECG Ltd), an expert services firm with offices in New Zealand and Australia.
2. I am a professional consultant; I provide advice and expert analysis in the areas of trading, risk management, public policy, and market analysis, with a particular focus on the energy sector. I have served as an energy consultant on these matters in New Zealand, Australia and the Philippines.
3. I have given expert evidence or advice on matters associated with energy markets before the Environment Court in New Zealand. I was a Member of the Ministerial Review of Electricity Market Performance in New Zealand 2009.
4. Before joining Sapere, I was General Manager Electricity Trading at Contact Energy (1996 – 2003) in charge of wholesale electricity trading and managing risks in the electricity market. During this period I was a member of the NZEM Clearing and Settlements Working Group, the NZEM Market Design Working Group and was Chairman of the NZEM Rules Committee. I was a member of the Electricity Governance Establishment Committee (2001–2003) and Chairman of the Rationalisation Working Group (2002–2003).
5. Prior to joining Contact Energy I was a futures broker from 1984 – 1995. My last role in futures markets was as Associate Director (Manager International Futures), Deutsche Bank Group/Bain Refco Commodities Ltd.
6. In preparing this report, I complied with the New Zealand High Court Code of Conduct for Expert Witnesses.

Scope of this report

7. This report contemplates whether what took place on March 26th 2011 could be interpreted as an event as defined in the Code¹ in the sense that the sum of the actions taken was *conduct in relation to trading that is misleading or deceptive, or likely to mislead or deceive*.

¹ Part 1 of the Electricity Industry Participation Code 2010

8. In particular, Genesis Energy has defended its actions on the basis that the actions they took were well signalled. On the basis of information available to me I conclude that:
- The outage was well signalled to wholesale market participants;
 - The fact that maintaining Huntly units 1-4 is costly was well signalled;
 - The actual costs of maintaining Huntly 1-4 are not well signalled;
 - The point that Genesis would act when it had a price setting role during the outage and set prices that were unprecedented was not well signalled; and
 - Genesis Energy's actions leading up to and during the event were either misleading or deceptive, or likely to mislead or deceive.

The event

9. Based on Mighty River Power's UTS claim in respect of activity that occurred 26 March 2011, and subsequent advice from MRP I understand the sequence of events to be:
- a. Market participants were advised on March 9th of the Otahuhu – Whakamaru outage for the stated purpose *OTA WKM C 220 kV Transmission Line TTU work*;
 - b. MRP saw the potential for "high" prices on Saturday 26th in the form of day ahead prices in the forecast prices released at 12.45 pm Friday 25th;
 - c. They modified their spot offer structures for generation plant in an effort to alleviate the high prices;
 - d. They sought hedge pricing from Genesis Energy for the duration of the outage at around 4pm on Friday 25th;
 - e. While MRP were considering Genesis Energy's offer a fresh market forecast showed that the "high" prices were alleviated (to under \$160/MWh);
 - f. It is not clear whether the drop in market forecast prices related to changes in offers made by MRP or changes made by Genesis Energy;
 - g. From 4.45 on the afternoon of Friday 25th until 5-minute prices were published around 10.30 Saturday 26th, when the outage commenced, there was no indication that the \$20,000 offers were in the stack and that they would set prices once the constraint began to bind; and
 - h. MRP felt Genesis Energy's hedge price offers were excessive under the circumstances and declined to take up the hedges.

Wholesale prices and hedging price risk in this event

Expectations

10. Genesis Energy states:²

Genesis Energy offered hedges to cover the potential trading risk market participants faced from the outage as late as Friday afternoon. Hedges were also offered during the constraint itself.

Prices offered into the wholesale market by Genesis Energy are designed to recover the costs of operating expensive thermal power stations, with high operating costs, in circumstances where they have declining utilisation. The prices obtained when its thermal units do run must cover the many trading periods when the units do not run.

- 11.** Genesis Energy's statement ignores the perspective of many firms who accept some spot price exposure as part of their electricity price hedging strategy. MRP, with its 24 hour desk and a professional trading management team, detected unusually high levels in the forecast prices and sought a quote for a hedge. Prices restored to more normal levels before they decided whether or not to take up Genesis Energy's offer and elected to not enter into those hedge arrangements. For many firms exposed to spot prices they would not have seen even that brief hint of what was to come nor, expected it.
- 12.** In an ideal world all of the purchasers exposed to the spot market would be fully aware of the risks they face and have access to appropriate hedge products.
- 13.** In the following sections I consider whether purchasers exposed to the spot market in the specific circumstances of March 26th could reasonably be expected to be fully aware of their risks i.e. that in the event of this outage prices would depart from the patterns of previous similar outages (or, as will be shown later, any previous situation).
- 14.** Some purchasers would be aware that there is no cap on prices but would have regarded an outcome such as occurred on Saturday 26th as a "low probability high consequence" event.³

² Genesis Energy press release: *Genesis Energy rejects accusation of "despicable" conduct by Powershop*, 30 March 2011.

15. Generator/retailers do enter into bespoke contracts to cover short term events such as an outage. This happens especially where a generator/retailer has generation on the low price side of the constraint and retail load on the high price side. However, few industrials enter into these short term hedges. As a rule they rely on managing their purchase risk through longer dated hedge contracts. Those who do have a residual spot exposure will reluctantly turn down load in a short term high price situation.⁴

The context for the event

16. The first forecast prices that indicated extreme price separation between Whakamaru and Otahuhu on Saturday 26th were received at around 12.45 pm on Friday 25th. Forecast prices for Otahuhu were then in the order of \$20,000/MWh. Those prices were then not indicated in forecast prices received from 4.45 pm Friday or until they appeared in published 5-minute prices around 10.30 am on Saturday 26th when the outage commenced.
17. As a result it is reasonable to conclude that the offer strategy based on offers of \$20,000/MWh and the accompanying generation configuration that ensured prices would clear at those levels came as a surprise to market participants.
18. The chart below plots all of Genesis's Energy's Huntly offers⁵ above \$1,000/MWh from January 2010 to April 2011. There does not appear to be a recent history of offer prices from Genesis at \$20,000/MWh

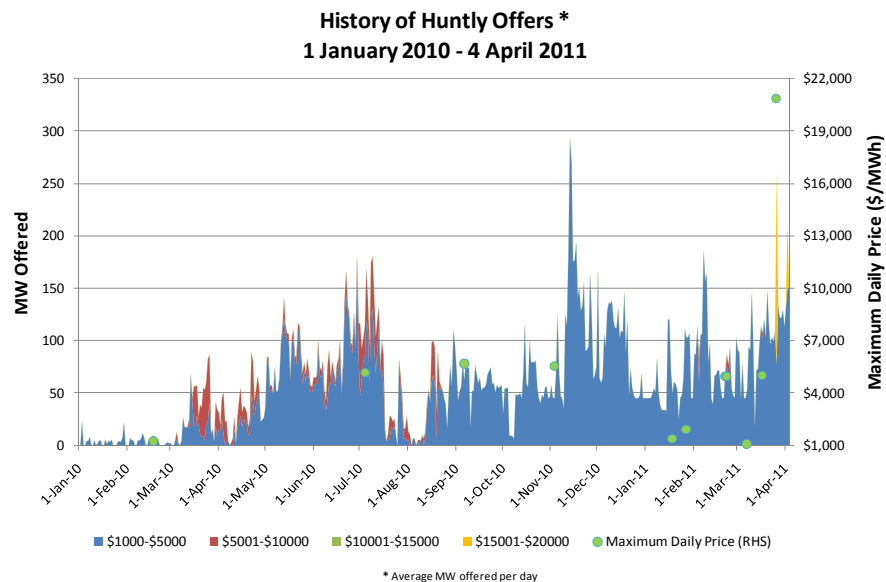
³ NZ herald April 5 2011

http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=10717057 While we accept that the outage was known of in advance, the level of prices could not have been predicted by Vodafone and is outside of any reasonable forecast based on previous experience.

⁴ UMR research and Electricity Commission Electricity Hedge Market Issues December 2009 The price threshold at which consumption will be cut also seems to vary, but is largely within the range of \$100-\$300 per MW/hr. Very few purchasers are willing to cut back on consumption and do so under duress.

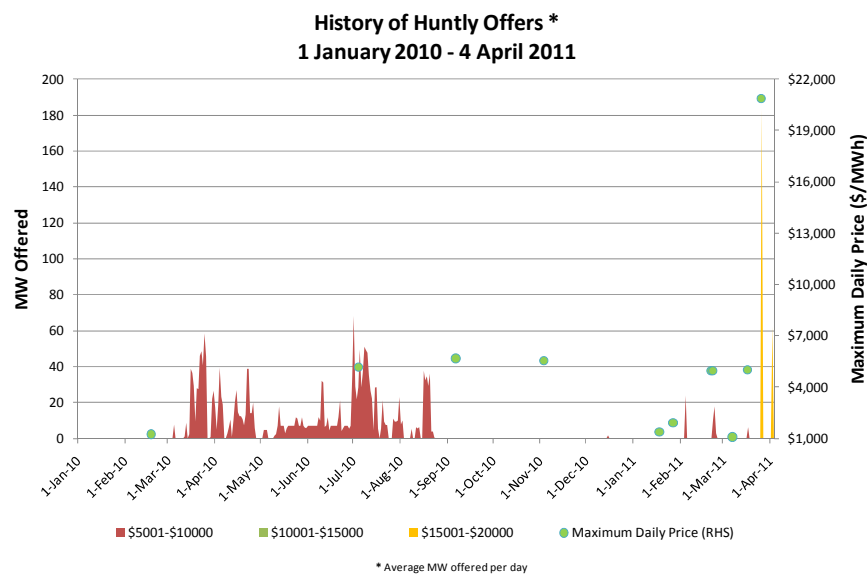
⁵ Note that these are offers and not necessarily cleared prices.

Figure 1 Huntly offer prices >\$1,000 and maximum daily prices Jan 2010 to date.



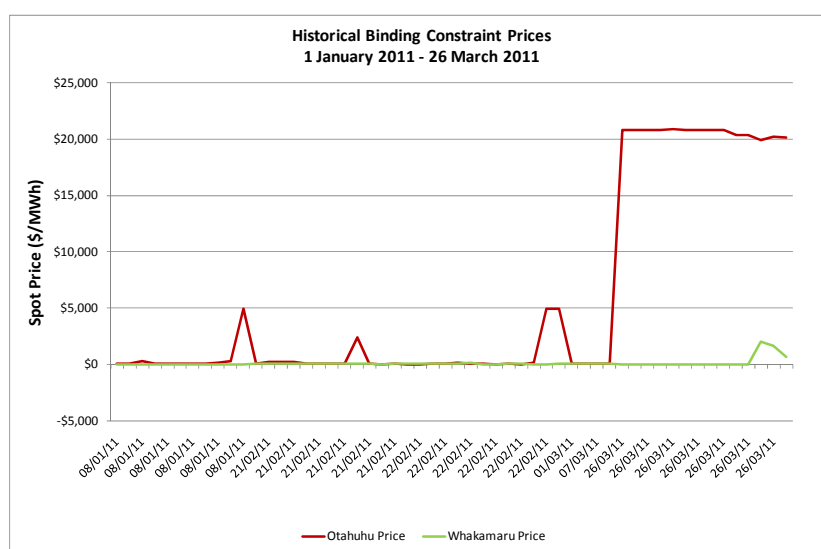
19. Figure 1 conveys a sense that a lot of offers lie between \$1,000/MWh and \$5000/MWh. In the chart below those offers are removed. The pattern of offering \$5,000 - \$10,000/MWh and the recent emergence of the \$20,000/MWh offers is apparent.

Figure 2 Huntly offer prices >\$5,000 and maximum daily prices Jan 2010 to date.



20. The offer of \$20,000/MWh is more than just a new strategy. It was instigated during a weekend when there was a maintenance outage and Genesis Energy could ensure it was the price setter.
21. The chart below plots actual cleared prices⁶ from 8 January 2011 to 26th March 2011. This illustrates the step change in cleared prices from recent patterns.

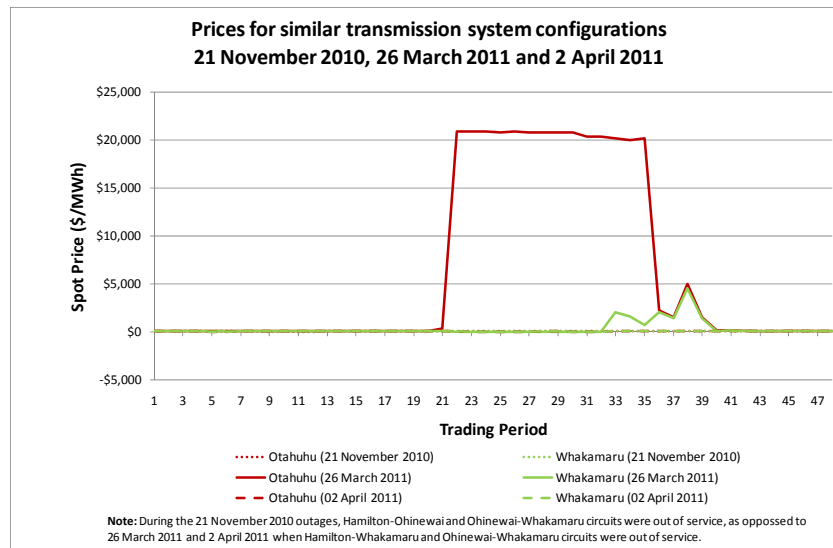
Figure 3 Cleared prices for Otahuhu and Whakamaru 8 January 2011 – 26 March 2011



22. The figure below compares spot price outcomes for Saturday 26th with previous similar outages:

⁶ That is provisional prices i.e. cleared subject to the outcome of this UTS investigation

Figure 4 Plot of prices in similar outages



23. Genesis Energy must have seen that forecast prices fell back from their initial market signal on Friday 25th. They would have known that another generator had acted to relieve the constraint. They appear to have taken further steps to trigger the high prices during the outage (as discussed in a Kieran Murray's report⁷).
24. Genesis Energy must have also been aware that prices of \$20,000 would surprise the wholesale market purchasers exposed to spot prices. The outage was well signalled and the fact that maintaining Huntly is costly is well signalled (although there is little available information on what those costs actually are). However the level of prices that would emerge during the outage was not “well signalled” and was unprecedented.

Wholesale price implications resulting from the event

25. Wholesale electricity prices have been determined by the market mechanism since 1 October 1996. The algorithm used for the calculations has changed very little since the inception of the market. Prices are determined for approximately 250 nodes and final prices for each node have been set at each node every half hour now for 253,920 half hours.

⁷ Kieran Murray *Claimed Undesirable trading situation 26 March 2011, 6 April 2011*

26. Since 2001 there have been a number of dry years in the sense that hydrological inflows have been lower than usual. These situations have caused what is regarded as high wholesale electricity prices. The table below plots every half hour price at Otahuhu from January 1 2001 to 31 December 2010 and includes what those periods of high prices. These have been ranked from highest to lowest. The chart shows that 0.01% of prices exceed \$1,183/MWh and 0.05% of the all prices for the ten year period lie around the \$1,000/MWh mark. The remainder fall below that level.

Figure 5 Half hourly wholesale electricity prices at Otahuhu from 1 January 2001 to 31 December 2010



27. Prior to March 26th 2011 in only 16 half hours in the 15 years since market inception have final prices exceeded \$5,000/MWh with the highest price recorded being \$11,822 for 1 trading period in August 2004.

Table 1 The 15 highest prices set in the New Zealand Electricity market since its inception in October 1996

Date	Trading period	Price Indication	Nodes	Periods	Comment
21-Aug-04	22	11822	32	1	Lower North Island
19-Jun-06	36	9685	239	1	New Zealand wide
27-Apr-09	38	8140	1	1	Fernhill
13-Feb-09	24	7540	1	1	Lichfield
25-Mar-06	47	6297	14	2	Upper South Island/West coast
19-May-09	16	5925	36	1	Lower North Island
27-Apr-04	17	5803	5	1	Southland
26-Oct-00	17	5618	1	1	Western Road (Hamilton)
06-Sep-10	36	5359	145	1	\$5000/MWh at Whirinaki
03-Nov-10	17	5359	143	1	\$5000/MWh at Whirinaki
21-May-09	16	5278	2	1	Kaikohē and Kaitaia
04-Jul-10	36	5272	49	1	Upper North Island (approx. Glenbrook north)
04-May-10	36	5260	2	3	Wairoa and Gisborne
Total number of trading periods				16	

28. The standing Whirinaki offer price was set at \$5,000/MWh as at 1 March 2010⁸ and has set the cleared price on 2 occasions. The top 8 prices on the table are most likely to be the result of a spring washer effect⁹ rather than cleared prices i.e. they are unlikely to be the result of actual offer prices and only appear for 1 trading period as a rule.

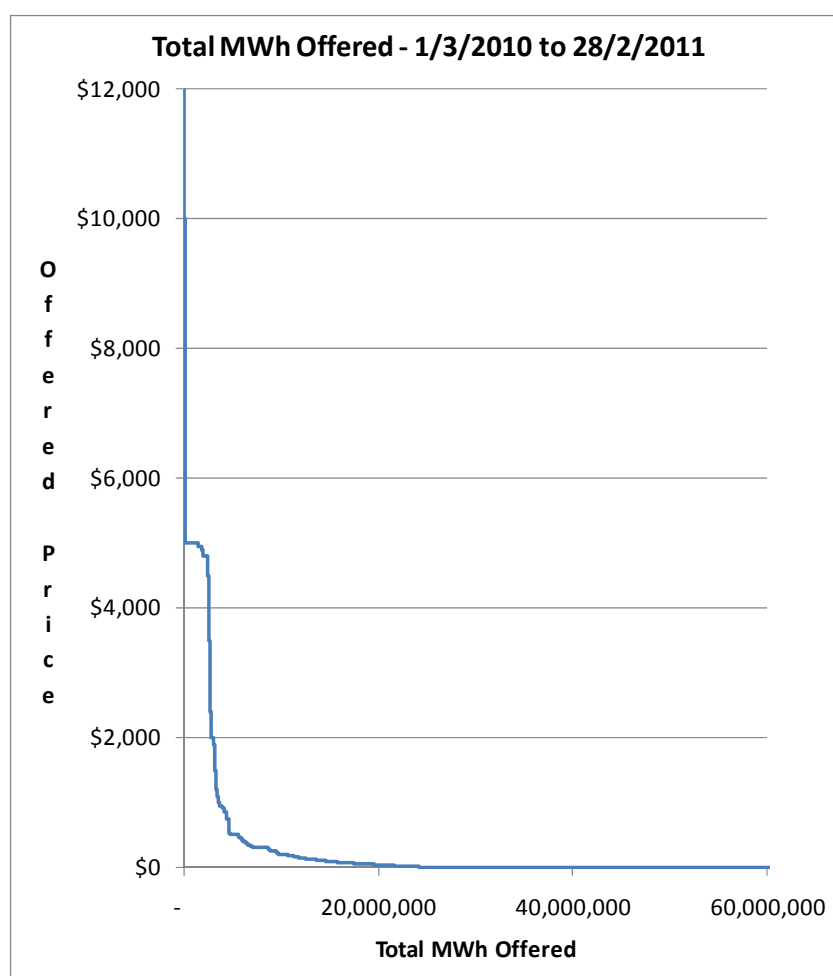
29. Generators tend to construct their daily offers on what energy they think they can get dispatched at the prices they expect in the market. They will price additional capacity at higher prices so if it required they are appropriately compensated. Common practice is to price the last MWs at very high prices signalling the prices they require should the system be tight and require very last piece of generation.

⁸ See appendix I

⁹ Some of these were the subject of claims for UTS as a result of high spring washer effects but we are unable to confirm that they are all spring washer effects

30. Figure 6 plots all wholesale electricity market offers 1 March 2010 – 28 February 2011 (approximately 7 million data points). Offers with zero volumes attached do not contribute to available MW hours. There was a single offer of 0.5 MW for a single trading period of \$20,000/MWh at Contact Energy's Stratford plant April 6 2010 but that is off the scale used here. Otherwise the next highest offer for the whole year was \$10,000.16.
31. This illustrates that there is cluster of offers around \$5,000/MWh in 2010/11 but offer prices are mostly below that level and the bulk are much lower.

Figure 6 All wholesale electricity market offers 1 March 2010 – 28 February 2011



32. The exact offers above \$4,900 are shown in the table below. Of the offers made during the year to 28 February 2011 17,511 tranches of Whirinaki generation were offered at \$5,000/MWh, 13,343 offers were made at higher prices and a total of 22,800 offers were made between \$4,900/MWh and 5,000/MWh.

Figure 7 Wholesale electricity market offers March 2010 – Feb 2011

Station	Price	Count	Station	Price	Count
SPL 0	\$ 20,000.00	1	ARI 0	\$ 5,100.00	114
HLY 6	\$ 10,000.16	5	ARI 0	\$ 5,100.00	114
TUI 0	\$ 10,000.07	2179	ARI 0	\$ 5,050.00	32
KTW 0	\$ 10,000.07	721	WHI 0	\$ 5,001.00	4
PRI 0	\$ 10,000.07	751	HLY 5	\$ 5,000.05	53
TKU 0	\$ 10,000.06	4599	HLY 4	\$ 5,000.04	17
HLY 5	\$ 10,000.05	131	ARI 0	\$ 5,000.01	5
HLY 4	\$ 10,000.04	414	ARI 0	\$ 5,000.00	6
HLY 3	\$ 10,000.03	612	KPO 0	\$ 5,000.00	32
HLY 2	\$ 10,000.02	408	MTI 0	\$ 5,000.00	3
HLY 1	\$ 10,000.01	168	OHK 0	\$ 5,000.00	3
RPO 0	\$ 10,000.01	9	WHI 0	\$ 5,000.00	17511
ARI 0	\$ 10,000.00	1	HLY 5	\$ 4,995.05	9
ATI 0	\$ 10,000.00	1	HLY 4	\$ 4,995.04	2
KPO 0	\$ 10,000.00	1	HLY 6	\$ 4,990.06	8347
MTI 0	\$ 10,000.00	1	KTW 0	\$ 4,950.07	2931
OHK 0	\$ 10,000.00	1	PRI 0	\$ 4,950.07	3013
WPA 0	\$ 10,000.00	1	TUI 0	\$ 4,950.07	3057
HLY 6	\$ 9,999.06	30	HLY 6	\$ 4,950.06	8
HLY 5	\$ 9,995.05	1	TKU 0	\$ 4,950.06	5
HLY 6	\$ 9,800.16	2897	HLY 5	\$ 4,950.05	12
ARI 0	\$ 9,500.00	4	HLY 4	\$ 4,950.04	65
HLY 5	\$ 8,505.00	12	ARI 0	\$ 4,950.00	25
TKU 0	\$ 8,505.00	5	ATI 0	\$ 4,950.00	3
ATI 0	\$ 6,000.00	4	KPO 0	\$ 4,950.00	5
KPO 0	\$ 6,000.00	7	MTI 0	\$ 4,950.00	39
MTI 0	\$ 6,000.00	8	OHK 0	\$ 4,950.00	5
OHK 0	\$ 6,000.00	8	WKM 0	\$ 4,950.00	26
WPA 0	\$ 6,000.00	8	WPA 0	\$ 4,950.00	4
ARI 0	\$ 5,501.00	9	TKU 0	\$ 4,902.06	4
HLY 4	\$ 5,500.04	4	TKU 0	\$ 4,901.06	1
ARI 0	\$ 5,500.00	2	KTW 0	\$ 4,900.07	422
ATI 0	\$ 5,500.00	1	TUI 0	\$ 4,900.07	731
KPO 0	\$ 5,500.00	5	PRI 0	\$ 4,900.07	121
MTI 0	\$ 5,500.00	4	TKU 0	\$ 4,900.06	3253
OHK 0	\$ 5,500.00	4	HLY 4	\$ 4,900.04	183
WPA 0	\$ 5,500.00	3	HLY 3	\$ 4,900.03	207
ARA 0	\$ 5,195.00	4	HLY 2	\$ 4,900.02	1
ARI 0	\$ 5,195.00	5	HLY 1	\$ 4,900.01	1
ATI 0	\$ 5,195.00	7	ARI 0	\$ 4,900.00	254
KPO 0	\$ 5,195.00	8	KPO 0	\$ 4,900.00	5
MTI 0	\$ 5,195.00	10	MTI 0	\$ 4,900.00	4
OHK 0	\$ 5,195.00	9	OHK 0	\$ 4,900.00	17
WKM 0	\$ 5,195.00	5	WKM 0	\$ 4,900.00	40
WPA 0	\$ 5,195.00	7	TUI 0	\$ 4,801.07	2

33. As a result of Genesis Energy's actions on Friday 25 and Saturday 26 potentially cleared prices were between \$19,000 and \$22,988/MWh¹⁰ for 9 trading periods, across 51 nodes and in all of those "high" price trading periods the prices were based on offer prices submitted by Genesis Energy in respect of their power stations. (Refer figure 3 and figure 4 above)
34. This move appears to have been confined to a situation where Genesis Energy was able to have a great deal of influence over what spot prices turned out to be and the implications of that are discussed elsewhere. If final prices are confirmed then it may herald a new era for the market. If generators are emboldened to set prices with an offer at \$20,000/MWh anyone pricing a hedge and anyone making a decision to hedge will now have to take that possibility into account more than previously. Hedge prices and retail tariffs will rise to take into account the higher risks for the seller of the fixed priced arrangements.

Huntly as dry year reserve

35. Genesis Energy has been clear that there is a significant cost associated with keeping Huntly units 1-4 available and they are frustrated in their efforts to secure a revenue stream to support them keeping the units available.
36. Genesis is reported as having signed one deal to cover at least one of the Huntly units as dry year reserve:¹¹

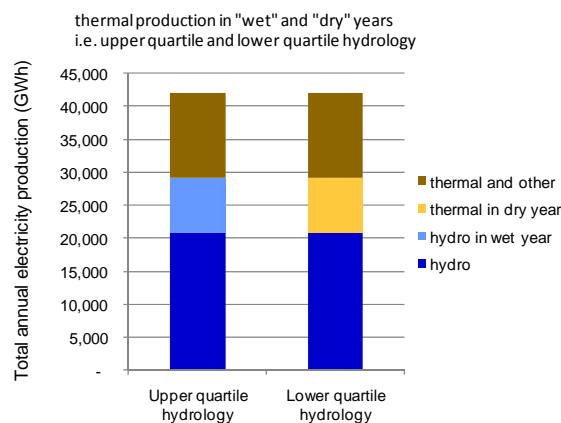
(Genesis Energy) signed a five-year hedge with Meridian Energy in 2009 to help extend the operation of the coal units and maintain their availability as dry-year reserve. But since then the industry has shown little interest in similar deals.

37. Genesis Energy refers to the role of Huntly units 1-4 as dry year reserve. The chart below illustrates what is meant by a "dry year". The chart shows there is an 8,500 GWh difference between the 75% quartile and 25% quartile annual hydro inflows in New Zealand. The suppliers of dry year reserve meet the shortfall and it can be this order of magnitude.

¹⁰ \$19,000 was set at HLY2201 and \$22,988 at MER0331

¹¹ Report of the Commerce Committee 2009/10 financial review of Genesis Power Limited 23 March 2011

Figure 8 Illustration of dry year reserve requirements in the New Zealand system



38. In order to provide dry year reserve Genesis has to effectively have generation capacity and fuel stocks idle and in place should they be required. Put simply the options for recovering the cost of this is to be either paid enough compensation in the years the reserve is called on or receive payments evenly across the years in the same way as insurance cover is paid.
39. That is different to the concept of peaking plant. Peaking plant tends to be fast start plant that can stand in at short notice where a system that is otherwise not energy constrained has a short term problem. They are typically units with lower costs to install in the first place and higher running costs than other plant (although not to the extent of prices seen in the March 26th event). For example the Whirinaki units currently run at \$508/MWh.
40. Genesis Energy are not necessarily required by the rules to defend how they arrived at an offer price of \$20,000/MWh but they must have known that this level of price was barely signalled and virtually without precedent in final prices.

Conclusion

41. Genesis Energy determined their offer price and embarked on their offer strategy knowing that they would set unprecedented price levels. They did this in a way that left most, if not all, wholesale purchasers exposed to the spot market on Saturday 26 March with a false sense of security. On that basis Genesis Energy's conduct in relation to trading during the event is misleading or deceptive, or likely to mislead or deceive.

Appendix I: Precedents for pricing commercial peaking plant in the New Zealand market

42. In 2010 Electricity Commission set the top Whirinaki offer at in 2010¹²:

The Whirinaki offer strategy is now being changed, as a result of concerns that the current strategy may be influencing the availability of other thermal plant. The change also supports the policy direction of Whirinaki becoming a commercial peaking plant, in that the new offer strategy is more commercial.

From 1 March 2010, the new capacity offer will take effect – Whirinaki will be offered at a fixed price of \$5,000/MWh, regardless of forecast prices.

43. This is separate from the Whirinaki reserve energy trigger price (RETP) which is set, and modified from time to time, to reflect the short-run marginal cost (SRMC) of the plant.

44. The Electricity Authority has now revisited the¹³:

The capacity offer applies during a Security Normal phase¹, when the risk of (hydro or thermal) fuel shortage in the near future is low, and hydro storage is above the 1% Hydro Risk Curve.

Whirinaki will be offered at a fixed price of \$5,000/MWh, regardless of forecast prices.

45. Aside from this indication of what a “commercial peaking plant” might seek to recover when it runs there has been little experience with peaking plant in New Zealand. In the early years of the NZEM Contact Energy offered its peaking plants in at Stratford, Otahuhu and Whirinaki at \$2,300/MWh, \$3,400/MWh and \$5,600/MWh respectively. At that time peaking plant was not utilised. Contact Energy decommissioned the generating ability at Otahuhu. They sold off the peaking units at Stratford and Whirinaki. New units were built at Whirinaki in 2003/4 under a contract with Government.

¹² Electricity Commission media release 12 February 2010

¹³ Electricity Authority media release 1 March 2011