

Improving Electricity Market Performance

**Discussion document's comments on
Wolak's analysis**

Report to the Major Electricity Users' Group

10 September 2009

Preface

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Executive summary

The preliminary report of the Electricity Technical Advisory Group (ETAG) discusses options for improving the performance of the New Zealand electricity market.

In reviewing wholesale and retail prices, the ETAG notes the “serious reservations” expressed by commentators about the recent analysis of the performance of the wholesale market undertaken by Professor Frank Wolak for the Commerce Commission. It also presents an alternative benchmark, which indicates no clear evidence of sustained or long-term exercise of market power.

The ETAG nevertheless highlights the scope for exercise of short-run market power in the wholesale market and its contribution to deficiencies in the level of hedging, provision of ancillary services, demand-side participation in the wholesale market and retail market competition in some regions. Several of the options the ETAG presents for improving wholesale and retail prices through increased competition and improving dry year management would significantly reduce opportunities for exercise of this market power and its magnitude.

Although imperfect, Wolak’s analysis has served the purpose of drawing attention to the problem of opportunity for exercise of market power in the wholesale market. The ETAG’s discussion document swiftly moves the debate on from the findings and limitations of Wolak’s analysis to the proposed solutions to this and the other problems and deficiencies of New Zealand’s electricity market. We consider this judicious.

We do not believe that the options presented by the ETAG would have differed without the criticisms of Wolak’s analysis, with the exception that the debate about the validity of Wolak’s analysis may have tempered the reallocation of assets in the proposed restructure of state owned enterprise generator-retailers. The implications of the ETAG’s comments on Wolak’s analysis are therefore only that, in making submissions on the discussion document, MEUG may wish to pay particular attention to the restructuring options presented and possibly advocate investigating a more aggressive reallocation of assets.

MEUG may also like to suggest investigating extension of the ETAG’s recommendation on improving pricing transparency and monitoring to include active market monitoring by the proposed Electricity Market Authority to assist market participants to manage their risk positions more effectively.

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1. Purpose

On 12 August 2009, the government released a discussion document on options for improving the performance of New Zealand's electricity market¹. This was the preliminary report of the Electricity Technical Advisory Group (ETAG) and Ministry of Economic Development (MED) to the Ministerial Review of Electricity Market Performance. The ETAG, with MED's assistance, was tasked with reviewing the performance of the electricity market, its institutions and governance, and recommending how these could be improved.

In reviewing wholesale and retail prices, the ETAG considers, amongst other evidence, recent analysis of the performance of the wholesale electricity market undertaken by Professor Frank Wolak for the Commerce Commission².

The Major Electricity Users' Group (MEUG) previously commissioned NZIER to provide a briefing to help non-economists to understand the highly complex Wolak methodology³. MEUG has asked NZIER to review the comments made by the ETAG on Wolak's analysis and to advise on whether the discussion document, and therefore its recommendations, gives sufficient weight to Wolak's findings on market power in the wholesale market.

2. ETAG's preliminary findings

2.1 Market objective

In the discussion document, the ETAG reviews the performance of New Zealand's electricity market relative to the ultimate objective that⁴:

A well-functioning electricity market should provide a reliable supply of electricity at competitive prices, that is, prices which are as low as possible consistent with ensuring reliable supply over the long term.

2.2 Current deficiencies

With regard to reliable supply, the ETAG considers that sufficient new generation is being built to meet increased demand and the quality of investment in generation is

¹ Electricity Technical Advisory Group and Ministry of Economic Development (2009) *Improving Electricity Market Performance*, preliminary report to the Ministerial Review of Electricity Market Performance, http://www.med.govt.nz/templates/StandardSummary___41689.aspx

² Wolak, F. (2009) *An Assessment of the Performance of the New Zealand Wholesale Electricity Market*, public version, report to the Commerce Commission, <http://www.comcom.govt.nz/BusinessCompetition/Publications/Electricityreport/DecisionsList.aspx>

³ NZIER (2009) *Exercising Unilateral Market Power in the Wholesale Electricity Market*, briefing to MEUG, <http://www.meug.co.nz/Site/Publications.aspx>

⁴ Electricity Technical Advisory Group and Ministry of Economic Development (2009), p.5.

generally good. It notes that New Zealand's hydro-dominated system remains vulnerable to dry years and, at such times, demand savings from public conservation campaigns can occasionally be a lower cost solution than building expensive spare generating capacity to cover every contingency.

With regard to competitive prices, the ETAG considers that the observed price rises of recent years are largely justified, given that the cost of generating electricity has increased, particularly with the run down of the Maui gas field, and the cost of building new capacity to meet increasing demand for electricity has risen sharply and is continuing to rise.

The ETAG does, however, find that the rate at which retail prices have risen, especially for residential consumers, seems excessive compared with the increase in the cost of new supply. It considers that improvements are possible in dry year management, as well as the reliability and capacity of the transmission system.

It identifies the main causes of these problems to include insufficient competition in the retail market, especially outside the main centres, combined with occasional opportunity to exercise market power in the wholesale market. These causes are exacerbated in dry years by incentives for some market participants to try to shift increased costs onto consumers through public conservation campaigns, rather than manage the risks themselves.

2.3 Recommendations for improvement

The ETAG makes a number of recommendations in the areas of improving retail competition and helping restrain prices, improving dry year management, helping restrain upward pressure on generation costs, improving procedures for upgrading transmission services, and, to support these changes, improving governance of the electricity sector.

The recommendations for improving retail competition and helping restrain prices are:

- Restructure some of the State Owned Enterprise (SOE) generator-retailers (by transferring SOE assets) to increase competition in the retail and wholesale markets.
- Introduce a transmission hedging mechanism to reduce risks created by transmission congestion.
- Allow lines companies back into retailing (subject to a number of tight restrictions to prevent anti-competitive behaviour).
- Provide for more demand-side participation in the wholesale market.
- Reduce retail costs and entry barriers by simplifying and standardising lines company tariffs and business rules.
- Consolidate the delivery of energy efficiency promotion in the Energy Efficiency and Conservation Authority (EECA), ensure that smart meters allow for optimal

energy efficiency functionality and encourage the development of smart tariffs which enable consumers to manage the costs of their energy consumption.

- Improve pricing transparency and monitoring.
- Encourage consumers to switch to retailers offering better deals, by upgrading the information on PowerSwitch, providing a \$5 million contestable fund to market the benefits of switching, and reducing the time required by retailers to switch customers

Also relevant to helping restrain prices are the recommendations for improving management of dry years, which are:

- Require that consumers receive compensation if public conservation campaigns are activated, and put a floor on spot prices during any such campaigns.
- Clarify roles and responsibilities for managing security of supply.
- Phase out the Reserve Energy Scheme, and re-assign to a SOE, or sell, the Whirinaki station.
- Develop improved provisions for access to “reserve water” in lakes in dry year emergencies, including compensating affected communities and improving environmental outcomes.

3. Wolak’s analysis

On 19 May 2009, the Commerce Commission released a report by Stanford University economist Professor Frank Wolak on the performance of New Zealand’s wholesale electricity market. The purpose of Wolak’s quantitative analysis was to investigate whether any market participants have a substantial degree of market power and, if so, whether these market participants have taken advantage of this market power.

Wolak’s methodology is founded on the use of actual data on system demand and suppliers’ offer curves to derive the “residual demand curve” faced by an individual supplier – that is, total demand in a half-hour trading period minus the offers of all other suppliers to show the remaining demand facing this supplier at each possible price. Wolak uses the slope (“inverse elasticity”) of this residual demand curve to provide a measure of the supplier’s “ability” to exercise unilateral market power. The steeper the slope, the greater the ability of the supplier to raise the market-clearing price by reducing the quantity it offers to supply. Wolak then nets off fixed-price forward market (hedge contract) obligations and uses the slope of this “*net* residual demand curve” to provide a measure of the “incentive” to exercise unilateral market power to raise, or alternatively lower, the market-clearing price in the wholesale market. This distinction between ability and incentive highlights that market power is a concern only if a supplier is not only *able* to influence the market-clearing price, but also *would gain* from so doing. Whether a supplier stands to gain depends critically on its exposure to spot prices in the wholesale market relative to its fixed-price forward market obligations.

As an additional step, Wolak constructs “competitive benchmark prices” – the prices he believes could be expected if the wholesale market was competitive – and measures the difference between these and actual market prices to provide an estimate of the market power rents earned by suppliers in the wholesale market⁵.

Wolak’s analysis found that, over the period 2001 to mid 2007, the four largest suppliers to New Zealand’s wholesale market, at times, had substantial ability and incentive to exercise unilateral market power by increasing or reducing their offer prices to raise or lower market-clearing prices. These times were concentrated in dry years. Wolak estimated these suppliers to have earned large market power rents in the wholesale market over these periods, totalling \$4.3 billion over 2001 to mid 2007.

Wolak’s analysis has drawn a lot of criticism, not all of it valid. Most criticisms have been directed at the way in which he constructs competitive benchmark prices and thereby estimates market power rents. Criticism of this additional step in his analysis does not detract from the earlier steps in his methodology of examining the slopes of residual demand curves to determine ability and incentive to influence market-clearing prices. This basic methodology is well-established and widely recognised and applied worldwide to assess competition in short-term wholesale markets. We consider the way in which Wolak has estimated market power rents not entirely applicable to New Zealand. In particular, adjusting for New Zealand’s heavy reliance on hydro power could reduce the estimated market power rents quite substantially. Changes in water levels are, nevertheless, insufficient to explain all of the observed price movements. Wolak’s finding remains that suppliers sometimes have substantial ability and incentive to exercise unilateral market power in the wholesale market, assisted by dry year conditions.

4. ETAG’s comments on Wolak’s analysis and the wholesale market

Section 5 of the ETAG’s discussion document on improving the performance of New Zealand’s electricity market reviews wholesale and retail prices. Appendix 13 provides further examination of the wholesale market. Amongst the evidence considered is Wolak’s analysis.

The ETAG notes that commentators have expressed “serious reservations” about Wolak’s analysis. It lists the main concerns as:

- Underestimation of the opportunity cost of hydro storage, that is, the value of water preserved for later use. It is efficient for spot prices to rise to reflect the increasing risk or probability of water shortages in advance of actual shortages, given the very serious and prolonged economic and social consequences of actually running out of water.

⁵ See NZIER (2009) for further explanation of Wolak’s methodology.

- 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.
- The “competitive benchmark” price (based on short-run marginal cost) used by the report to calculate market power rents is not sufficient to cover the costs of building new capacity and ensuring security of supply.
- The analysis is done in hindsight, and assumes perfect foresight on the part of decision-makers, with no apparent allowance for the uncertainties that parties face in the real world, such as regarding future demand, plant reliability and hydro inflows.
- The analysis uses actual demand to estimate the competitive benchmark price in dry years, which ignores demand response to high spot prices. This biases the estimated competitive benchmark price downwards (or assumes that demand response is “free”).
- Detailed analysis has not been done to establish that any excessive prices in the spot market have been passed on to consumers. Few consumers are exposed to spot prices.

The ETAG does not comment on the validity of each of these criticisms.

Instead, it presents an alternative benchmark for assessing wholesale market performance – the long-run marginal cost (LRMC). Use of this alternative benchmark involves comparing average contract prices over time in the wholesale market with the LRMC in terms of the cost of building new capacity. To demonstrate this alternative benchmark, the ETAG compares a range of contract price indicators over 1998 to 2008 with the estimated cost of new supply, represented by production from a new combined cycle gas turbine. The contract price indicators and the estimated LRMC followed a broadly similar pattern over time. Although there were times when the contract price indicators were higher or lower than the estimated LRMC, these periods seldom lasted more than 12 to 24 months. From this comparison, the ETAG concludes that “there is no clear evidence of the sustained or long-term exercise of market power”⁶.

The ETAG does, however, highlight that there is still opportunity for the exercise of short-run market power in the spot market, especially in dry years or under transmission constraints, when supply is already constrained. Far from dismissing this short-run market power, the ETAG stresses its detrimental consequences in undermining the efficient level of hedging and competitive provision of ancillary services. Difficulties in hedging in turn contribute to under-developed demand-side participation in the wholesale market and insufficient retail market competition within some regions. The range of options it presents for improving wholesale and retail prices through increased competition and improving dry year management include measures that would reduce opportunities for the exercise of short-run market power in the wholesale market.

⁶ Electricity Technical Advisory Group and Ministry of Economic Development (2009), p.40.

5. Review of ETAG's comments

We begin by addressing briefly each of the criticisms of Wolak's analysis noted by the ETAG, before considering whether these have led the ETAG to give insufficient weight to the problem of market power in the wholesale market.

5.1 Criticisms of Wolak's analysis

5.1.1 Opportunity cost of stored water

Underestimation of the opportunity cost of hydro storage, that is, the value of water preserved for later use. It is efficient for spot prices to rise to reflect the increasing risk or probability of water shortages in advance of actual shortages, given the very serious and prolonged economic and social consequences of actually running out of water.

We agree strongly with this criticism. New Zealand's heavy reliance on hydro power makes the opportunity cost of stored water important. In setting offers into the wholesale market, hydro generators take into account the opportunity cost of using water now that could be stored for future use when wholesale prices may be higher.

The opportunity cost of stored water cannot be observed directly; it depends on not only current water levels and inflows, but also generators' expectations of future inflows and degrees of risk aversion to running out of water. Wolak therefore uses a proxy. He sets the upper bound of the opportunity cost of water equal to the marginal cost of the highest variable cost fossil fuel unit needed to serve demand. Wolak calls this approach "conservative" in that it may overestimate competitive benchmark prices and argues that the opportunity cost of water is not relevant most of the time, only during or approaching dry spells.

This approach may be reasonable in other countries, which are less dependent on hydro and have larger thermal capacity. It is less applicable in New Zealand, given our heavy reliance of hydro and relatively modest storage capacity. When we run short of water, prices in New Zealand can and do rise to several times the short-run marginal cost (SRMC) of gas or other fossil fuel generation and can stay high for several months at a time. There is insufficient gas or other fossil fuel generation capacity available in New Zealand to serve all demand, such that this cannot provide a "cap" on the hydro price. We face very high cost if we run out of water, resulting in rolling blackouts and economic losses. The probability of such costs rises as we get closer to a shortage, which raises the expected opportunity cost of water beyond the most expensive thermal generation.

The implication is that Wolak's methodology, in understating the opportunity cost of stored water, underestimates the competitive benchmark price during or approaching water shortages, and therefore overestimates the market power rents earned by suppliers in dry years.

Although using a more appropriate opportunity cost of water could reduce the estimated market power rents quite substantially, changes in water levels are, nevertheless, insufficient to explain all of the observed price movements. Wolak's construction of competitive benchmark prices to estimate market power rents does not affect the earlier steps in his methodology that show that suppliers have at times had substantial ability and incentive to influence market-clearing prices.

5.1.2 Availability and opportunity cost of gas

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.

As we note above, there is insufficient gas or other fossil fuel generation capacity available in New Zealand to serve all demand, such that this cannot provide a price cap for water.

There is also, in effect, an opportunity cost of gas. In setting offers into the wholesale market, gas generators, as hydro generators do for water, may take into account the opportunity cost of using gas now that could be left for future use when wholesale prices may be higher. Gas was also subject to supply uncertainties over the study period.

We therefore do not disagree with the second of the criticisms noted by the ETAG, although believe that the ETAG intended the wording to be *overestimation* of the availability and underestimation of the opportunity cost of gas.

5.1.3 Short-run or long-run marginal cost

The "competitive benchmark" price (based on short-run marginal cost) used by the report to calculate market power rents is not sufficient to cover the costs of building new capacity and ensuring security of supply.

We agree that Wolak's competitive benchmark price, in being based on SRMC, does not cover the costs of building new capacity. Over the long run, generators need to cover more than short-run costs, but also their capital costs and fixed operating costs. Inability to cover long-run costs presents a risk to sufficient investment in generation capacity to ensure security of supply. We consider the ETAG's comparison of contract prices over time with LRMC, to test for the sustained exercise of market power over the long run, could potentially be a useful addition to the analysis available in the public domain, subject to greater transparency around the methodology, data and assumptions used.

We disagree, however, that this constitutes a valid criticism of Wolak's analysis. SRMC is the appropriate benchmark for assessing whether the wholesale market, or any short-run market, is competitive, as SRMC is the basis for firms' decisions on the quantity to supply in the short run. Market entry and exit and expansion and contraction in generation capacity, which are based on LRMC, are a different decision.

Even in the wholesale market, however, many generators earn more than their SRMC. All supply selected for dispatch receives the market-clearing price. The market-clearing price is set by the last supplier, with the highest offer, needed to meet system demand. For most suppliers, this market-clearing price is therefore greater than their offer prices, which, if the supplier is a profit maximiser, is the price on its residual demand curve associated with the quantity at which its marginal cost equals its marginal revenue.

As for security of supply, ultimately, if generation capacity is insufficient, prices should rise, attracting investment in more capacity. This can take time and may be impeded by barriers to entry, which include the large investment costs, long timeframes to plan, consent, construct and operate plant, financial risks and regulatory uncertainty. Barriers to entry are, however, a different problem to that investigated by Wolak, which is the exercise of unilateral market power in the short run. Granted, the two are related in that price volatility and difficulty securing hedge contracts can increase the financial risks to new entrants, and entry, or the threat of entry, can impose discipline on the prices of incumbents.

5.1.4 Allowance for uncertainty

The analysis is done in hindsight, and assumes perfect foresight on the part of decision-makers, with no apparent allowance for the uncertainties that parties face in the real world, such as regarding future demand, plant reliability and hydro inflows.

We agree that uncertainties that impact on short-run supply decisions are relevant in assessing the performance of the wholesale market in the short run. A prime example of this is the opportunity cost of stored water, which we discuss above. In setting offers into the wholesale market, hydro generators take into account the opportunity cost of using water now that could be stored for future use when wholesale prices may be higher. This opportunity cost reflects not only current water levels and inflows, but also expectations of future inflows and risk aversion to running out of water, given uncertainty around future inflows. It may well have a significant “option value”; once used, water is gone, but, even if future inflows are expected, generators may value deferring the decision to use water – i.e. value retaining the option – until a future date when they have better information on whether their expectations are likely to be realised.

We disagree, however, that Wolak’s analysis should have included uncertainties around investment and its return, as these relate to long-run performance and decisions on market entry and exit and investment in capacity. These uncertainties are not relevant to decisions on the quantity to supply in the short run, which is what Wolak’s analysis is investigating for exercise of market power.

5.1.5 Demand quantity at competitive benchmark price

The analysis uses actual demand to estimate the competitive benchmark price in dry years, which ignores demand response to high spot prices. This biases the estimated competitive benchmark price downwards (or assumes that demand response is “free”).

This criticism seems to us to be somewhat misleading in that actual demand is just one component in Wolak’s approach to constructing competitive benchmark prices. Furthermore, this criticism does not acknowledge Wolak’s admission of the limitations of using actual quantities nor the difficulty of calculating competitive benchmark quantities.

Wolak’s explanation of how he calculates competitive benchmark prices is quite involved and not easy to follow. Our reading of it is that he holds constant the quantity component of actual offers over 2001 to mid 2007 whilst he changes the price associated with each actual offer quantity in constructing the "no-market-power counterfactual offer curves" for each of hydro and thermal generation. In other words, he assumes that suppliers would still offer the same quantities as they actually did in each half hour even under lower offer prices. Wolak admits the limitations of this approach. First, the actual quantity suppliers offered may have reflected some withholding of quantity to push up prices. Second, if the market was competitive, the optimal quantities offered by suppliers in each half hour to maximise their profits across all half hours would likely be different to the quantities they actually offered. Where water can be stored, suppliers could be expected to reallocate quantities across half hours to give the optimal allocation over time under the alternative prices. Wolak makes the simplifying assumption of using actual offer quantities and changing only offer prices because working out the optimal distribution of quantities across half hours under the alternative prices would involve very complex modelling, requiring the solution of a stochastic dynamic programming problem, the results of which would be very sensitive to assumptions, including about the future distributions of water inflows.

For thermal generation, both counterfactual scenarios for computing competitive benchmark prices change the offer price associated with each actual offer quantity to the marginal cost (including fuel cost) of supplying this quantity. For hydro generation, Wolak uses two different approaches, because we cannot observe the "fuel cost" of water as we can for fossil fuels. In counterfactual 2, he changes the hydro offer price associated with each actual hydro offer quantity to the lower of either the actual offer price or the marginal cost of the highest cost fossil fuel unit in New Zealand during that half hour (which Wolak argues the opportunity cost of water would never exceed, so therefore provides a cap on offer prices). Counterfactual 1 involves, as above, using the actual hydro offer quantities, but instead of setting alternative hydro offer prices, leaves these offer prices unspecified and allows the competitive benchmark prices for the market as a whole to be determined by the intersection of the no-market-power thermal offer curve (which comprises actual thermal offer quantities and thermal offer prices reset to marginal costs) with the system demand curve less the actual hydro quantities supplied.

There is a second way in which Wolak uses actual demand. He calculates the difference between actual market prices and his constructed competitive benchmark prices. He then multiplies this price difference by the actual quantities supplied to meet system demand to provide an estimate of the market power rents earned by suppliers through exercising their market power to raise prices.

We agree that the difference between actual prices multiplied by actual quantities and competitive benchmark prices multiplied by competitive benchmark quantities would have been preferable, if practicable. Although firms are generally willing to supply less at lower prices than higher prices, the actual offer quantities of the suppliers in this case, as Wolak points out, may reflect some withholding of quantities to exert upward pressure on prices. Without market power, firms are generally willing to supply more at a given price. Furthermore, the actual quantities supplied to meet system demand, which Wolak multiplies by the difference between actual and competitive benchmark prices, will reflect any reduction in actual demand that occurred during dry years, whether in response to sustained periods of high prices or public conservation campaigns.

Using actual demand in this way does not necessarily cause overestimation of market power rents. A smaller price difference multiplied by a larger quantity, both due to demand response to lower prices, could result in a larger estimate of market power rents.

We do consider Wolak's competitive benchmark prices to be too low in dry years, and therefore to overestimate market power rents, but not for the reason given in this reported criticism – instead, due to understating the opportunity cost of stored water, as we discuss above.

5.1.6 Pass through to retail

Detailed analysis has not been done to establish that any excessive prices in the spot market have been passed on to consumers. Few consumers are exposed to spot prices.

When Wolak's report was released, its estimate of \$4.3 billion in market power rents was interpreted in much of the public media as a transfer of wealth to suppliers from electricity consumers.

As an estimate of market power rents in the wholesale market, this relates to transfers between wholesale market participants. Generators have some fixed-price contracts and retail load obligations at fixed prices. Under vertical integration, they in effect sell to their retail businesses. They therefore make a net gain from higher spot prices in the wholesale market on only some of their generation. Furthermore, Wolak's analysis found that some suppliers have an incentive to exercise market power to *lower* market-clearing prices in the wholesale market, to reduce the cost of meeting their fixed-price forward market obligations. Although the ETAG says of Wolak's competitive benchmark price comparison "Through much of the period, the

actual price was well above the estimated benchmark...⁷, in fact Wolak found the difference to be very small for the majority of half-hours and the majority of years. His estimate of market power rents was dominated by three periods when the price difference was very large and remained so for three to six months.

In New Zealand, end consumers are highly contracted and not exposed to high shortage prices. During dry years, retail prices are well below spot prices.

Wolak's estimated market power rents say nothing about the retail market. Wolak presents some data on the retail market and suggests that high spot prices ultimately feed through to higher retail prices after a lag. This analysis is limited, however, as the focus of the report is the wholesale market, and does not establish conclusively whether, and if so to what extent, high spot prices in dry years are passed through to future retail prices. The Commerce Commission had intended Wolak to follow this analysis of the wholesale market with quantitative analysis of the performance of the retail market. The Commerce Commission decided not to continue with the latter, however, given the overlap with the brief for the Ministerial Review of Electricity Market Performance.

Higher than competitive prices in the wholesale market may well have had some impact on retail prices, as well as on prices to major users that contract directly with generators, but we agree that Wolak's analysis does not demonstrate this.

5.2 Market power in the wholesale market

Despite noting the "serious reservations" expressed by commentators about Wolak's analysis and presenting an alternative benchmark, which indicates no clear evidence of sustained or long-term exercise of market power, the ETAG nevertheless highlights the scope for exercise of short-run market power in the spot market and its contribution to deficiencies in the level of hedging, provision of ancillary services, demand-side participation in the wholesale market and retail market competition in some regions.

We do not consider the ETAG to have insufficiently acknowledged the problem of exercise of short-run market power in the wholesale market. In our view, several of the options it presents for improving wholesale and retail prices through increased competition and improving dry year management would reduce opportunities for, and the magnitude of, short-run market power exercised in the wholesale market.

In conclusion, Wolak's analysis has served the purpose of drawing attention to the problem of opportunity for exercise of market power in the wholesale market. The ETAG's discussion document swiftly moves the debate on from the findings and limitations of Wolak's analysis to the proposed solutions to this and the other problems and deficiencies of New Zealand's electricity market. We consider this judicious.

⁷ Electricity Technical Advisory Group and Ministry of Economic Development (2009), Appendix 13, p.90.

We do not believe that the options presented by the ETAG would have differed without the criticisms of Wolak's analysis, with the exception that the debate about the validity of Wolak's analysis may have tempered the reallocation of assets in the proposed restructure of SOE generator-retailers. The implications of the ETAG's comments on Wolak's analysis are therefore only that, in making submissions on the discussion document, MEUG may wish to pay particular attention to the restructuring options presented and possibly advocate investigating a more aggressive reallocation of assets.

MEUG may also like to suggest investigating extension of the ETAG's recommendation on improving pricing transparency and monitoring to include active market monitoring by the proposed Electricity Market Authority to assist market participants to manage their risk positions more effectively.