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“Infratil Update” is prepared for shareholders and bondholders as an update of company news. It is published alternately between Interim and Annual Reports.

New Zealand electricity: Lessons from the winter of 2001

The 2001 Power Crisis - What happened?

There are many different views about what caused the power crisis in New Zealand this year and what should be done about it. This newsletter gives the views of Infratil and Morrison & Co on the power crisis. The beginning of the newsletter focuses on what happened this year. The second half provides some views and perspectives about weaknesses of the electricity industry structure, what we would do about those weaknesses if we were responsible for creating an industry structure to serve New Zealand well, and finishes with a short view about Infratil’s current exposure to the industry.

It has been very dry....

This has been a very dry year for the hydro generators. The 2001 year started with the South Island hydro reservoirs full, but since then we have received 22% less than normal inflows. The following graph shows inflows into the hydro lakes have been consistently in the lower quartile of the historical range.

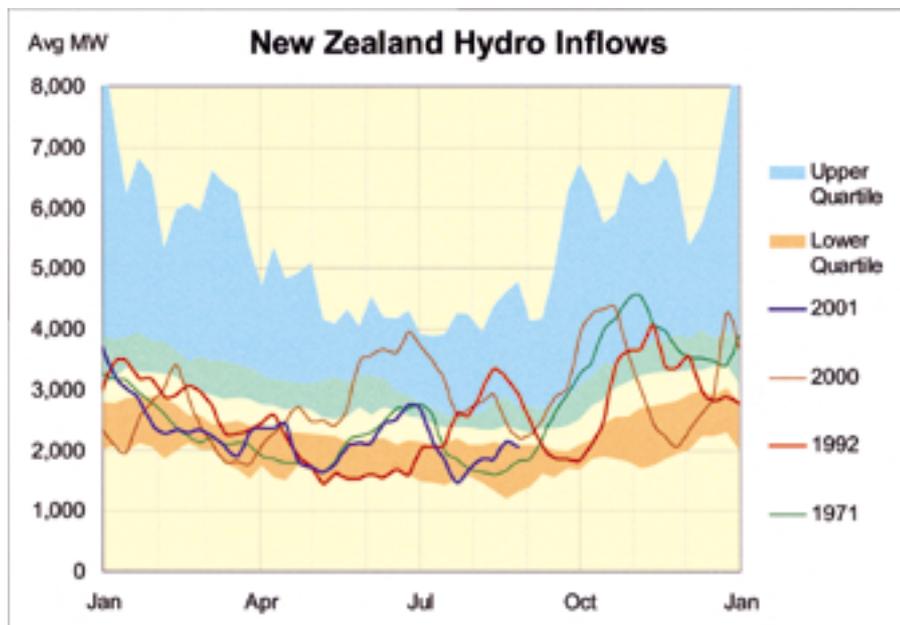


Figure 1: New Zealand hydro inflows in 2001 compared with the historical range

The left-hand scale of "Average MW" reflects a translation of water inflows to the average MW that can be generated from the inflows over the month. The New Zealand demand peaks at an average of 4,500 MW over the winter months (actual daytime peaks are 6,000 MW). The thermal plant alone cannot meet all winter demand (useable thermal plant energy is around 2,300-2,500 average MW per month) and some draw downs from dam water storage are needed to avoid a shortage situation.

The severity of the 2001 drought can be illustrated if the total inflows from January to August are calculated for each of the last 71 years of recorded history and sorted from driest to wettest. It is the cumulative inflow picture that tells the story.

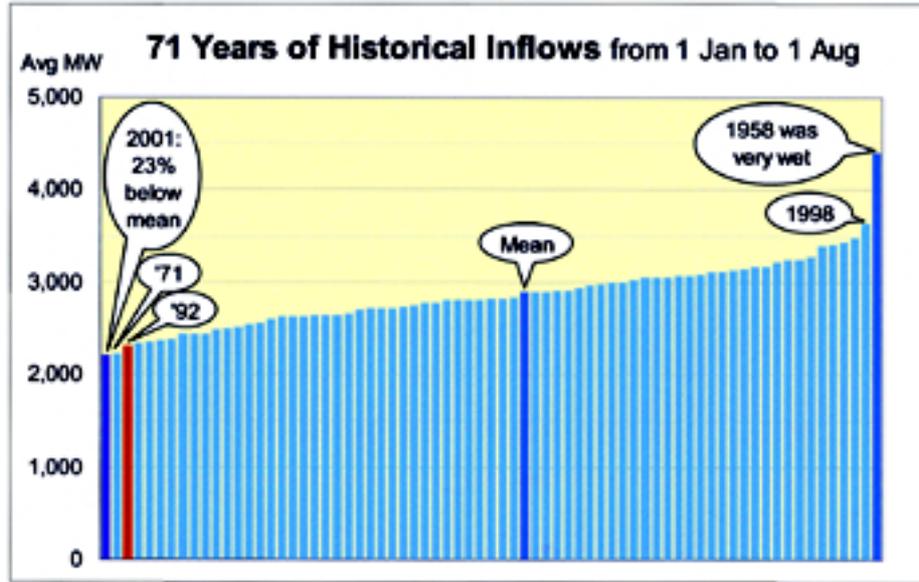


Figure 2: The 2001 year has had the lowest hydro inflow in the last 71 years

In hydroelectric terms, 2001 is the worst drought we have experienced in the last 71 years, for the first seven month period of each year. This year is worse than the last electricity shortages in 1992. Only one other year, 1971, had similar total inflows. A 71 year hydrological record is not that full a description of the range of possible inflow and as shown in the following fitted distribution, industry players have to acknowledge the chance of it being even drier, albeit low, than the worst yet experienced droughts.

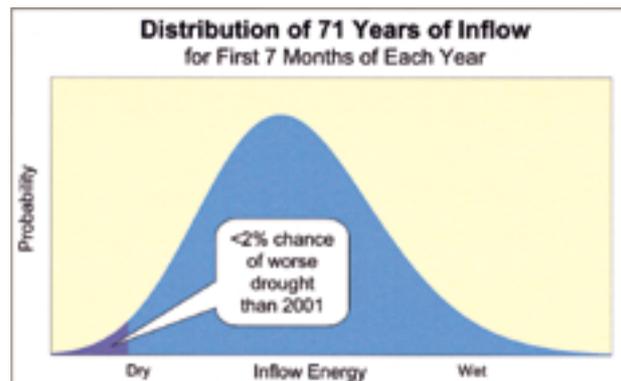


Figure 3: Fitted probability distribution of hydro inflows

Electricity demand growth has firmed a little

Typically electricity demand growth is of the order of 2% to 3% per annum. However, this year a combination of increased overall demand plus an early cold snap resulted in demand levels reaching new record levels in June.

The following chart shows the demand each month for the last few years. As can be seen, demand in 2001 was consistently greater than that in the previous year by around 3% to 4%. By June it was 5% higher than the previous year, although as can be seen from the graph, June 2000 was unusually mild and had lower than normal demand.

The NZ electricity industry faced the combination of the worst drought in 71 years and higher demands caused by a 3-4% underlying growth in demand.

The combined effect of industry and others responding to the high prices and the call for demand savings from the beginning of August can be seen.

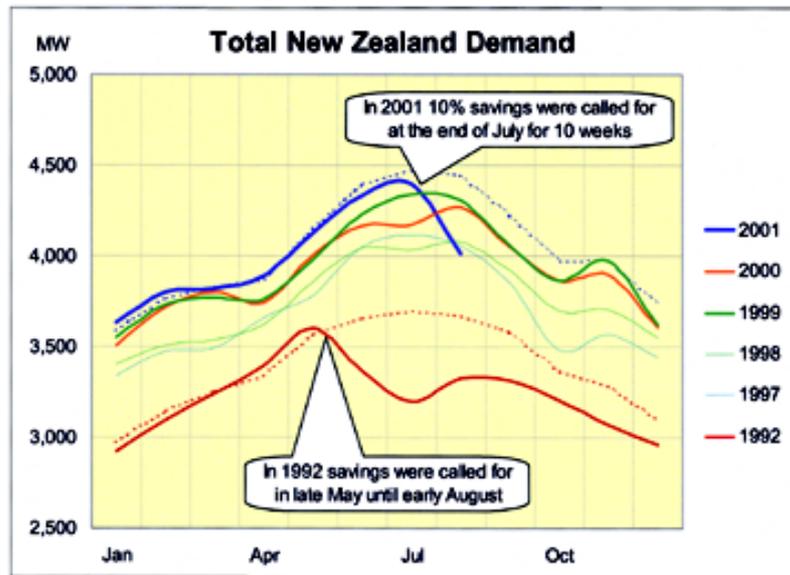


Figure 4: Demand growth in 2001 was very strong in the first half of the year

Hydro storage has reached the lowest level in 22 years

The combination of low inflows and high demand had an adverse impact on hydro storage this winter.

New Zealand has a high reliance on hydro electricity and a certain minimum level of storage is required to absorb the daily fluctuation in hydro inflows and to ensure the wintertime electricity demands can be met without compulsory rationing.

The following graph shows the total amount of potential electrical energy stored in New Zealand's major hydro lakes for 2001 and five other selected years. The graph also shows the highest and lowest hydro storage levels at each time of the year for the last 22 years, excluding 1992, which was abnormally low due to very low starting storage and the hydro management practice of that time.

The graph shows that from being very full at the start of the 2001 year, hydro storage levels fell rapidly during the summer so that, by the beginning of winter, hydro storage was as low as it had ever been in the last 22 years, barring 1992. During April, May and June hydro storage continued to fall rapidly, until the end of June when there was a rain storm which refilled the lakes somewhat. In July inflows reverted to the drought pattern and lakes fell even more rapidly as the increasing winter demand required extra generation.

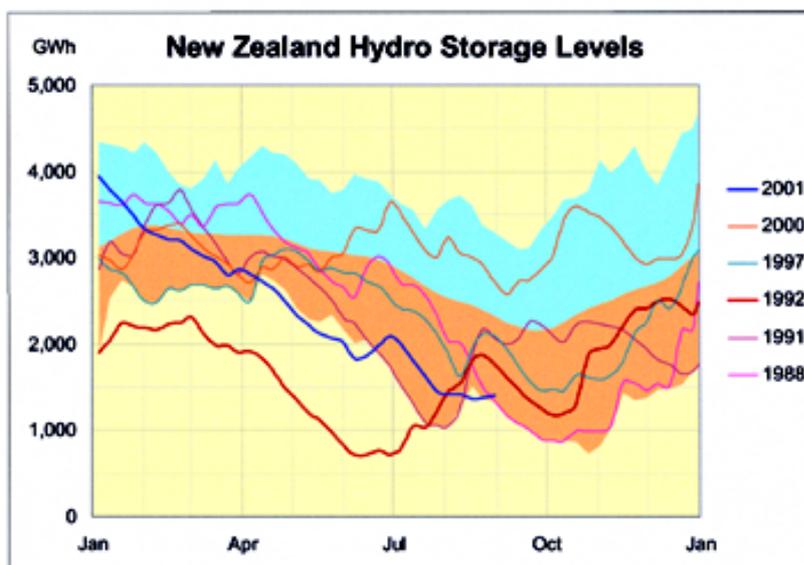


Figure 5: Barring 1992, hydro storage levels were at historical lows from April to June, and in August

Electricity spot prices reached all time highs



The combination of low inflows, declining hydro storage and rapidly increasing demand resulted in spot electricity prices skyrocketing to levels not previously sustained for any period.

The following chart shows the average monthly electricity prices since the beginning of the market. On a monthly basis prices reached five to six times the normal level this winter. Although spot prices have peaked at this level from time to time in the past, they have never been sustained at such a high level since the market was established in October 1996.

A sharp rise in spot prices should not be surprising given the unusual combination of circumstances this winter. A hydro company that is facing the risk of running out of storage needs to increase its offer price sufficiently high to get all of the reserve thermal plant to run at capacity. This price signal also provides the opportunity for consumers to benefit by voluntarily backing off lower value consumption now, rather than facing much higher prices or compulsory blackouts later. Whether the price should be \$150/MWh or \$250/MWh is a surprisingly grey issue of judgement, based on a balance of probability and forecasts of the future. Winter prices need to occasionally reach these high levels, and feed into firm average contract prices, to provide appropriate market signals for the investment in, and maintenance of, backup thermal plant (such as New Plymouth and Huntly) and minimum hydro storage reserves. Similarly, occasional very high peak prices are necessary to provide incentives to build and maintain peaking capacity to cover demand fluctuations or plant breakdowns. High prices usefully signal to consumers the value of moderating their purchases when supply is constrained but, as discussed later, not many consumers currently see/experience price fluctuations.

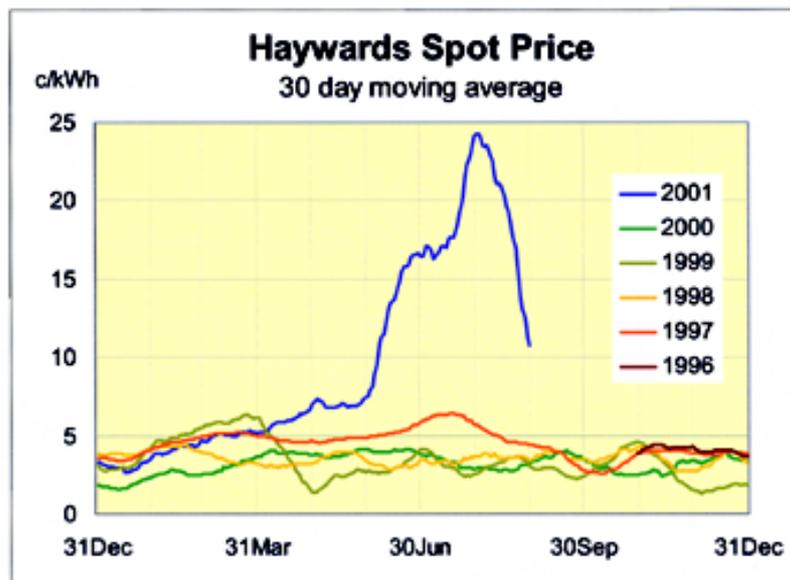


Figure 6: Electricity Spot Prices reached five to six times normal levels in June and July

Are we heading for a crisis next year?

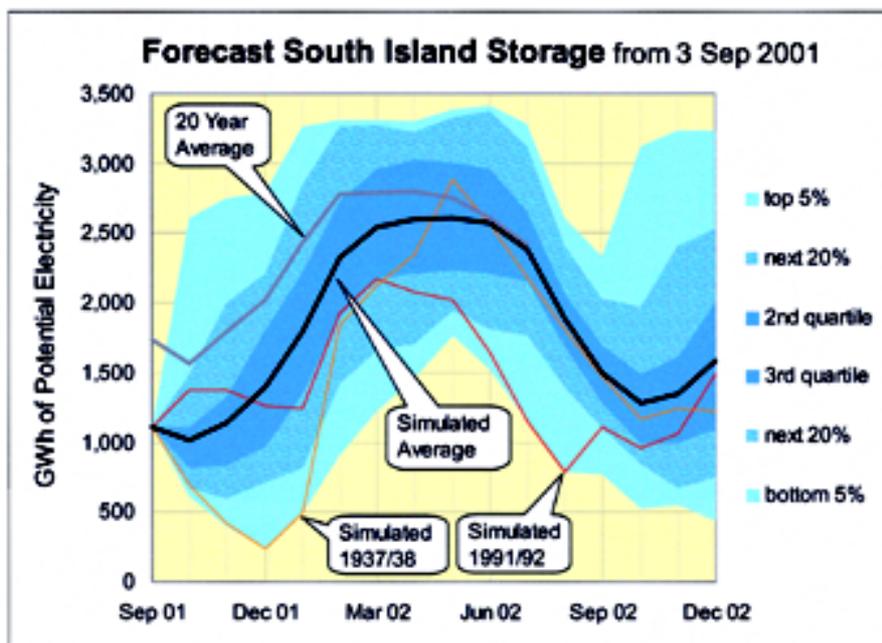
On behalf of Infratil, Morrison & Co has carried out a set of electricity market simulations to assess this risk. These simulations account for expected thermal and hydro plant performance under a set of possible future random hydro inflows and plant breakdown scenarios. The analysis is conservative in that it is assumed demand reverts back to the level that would have been predicted on the basis of the normal seasonal pattern with some reduction based on price but without the full 10% savings being called for by the Government.

The simulation shows that, despite the fact hydro storage levels are likely to be around 20% to 30% below normal going into 2002, they should be back to normal minimum levels going into next winter, even if inflows are low. With the lower demands over the summer, there is sufficient spare thermal plant to substantially restore South Island storages to a non-critical level. Clearly prices would need to be firm enough to bring on this plant.

The graph below projects lake levels from September to the end of 2002. It shows how the lake levels recover over the summer to enter the next winter in good shape and, as a consequence, the chance of the lakes emptying is low. The fact that we have had a crisis this year does not significantly increase the risk of having a crisis next year.

The worst case scenario (1 in 70 risk) would be for inflows to be as low as they were in 1991 and 1992 from now until next winter. In this case the simulations indicate hydro reservoirs would end up at similar levels to this year. Such an outcome cannot be ruled out but would be very unlikely.

Saving demand this year will not significantly affect the risks of a crisis next year. Accounting for the range of spring inflows, there is roughly a 20-30% chance of some spill from storage this summer even starting from current low lake levels. Thus any special savings effort now may well be wasted completely (if saved water is subsequently spilled) or simply reduce generation from a low cost thermal power station later in the summer.



Source: HRL Morrison & Co Electricity Market Model

Figure 7: The risk of another “crisis” next year is not significantly higher than a normal year

How did the Government perform during the “crisis”?

Infratil thinks the Government was right to reject price caps

When spot prices increased substantially in June a number of market participants found themselves financially exposed and there was pressure on the Government to intervene in the market and impose some form of price cap.

The Government quite correctly, in Infratil’s view, resisted this pressure and preserved the integrity of the market.

The consequences of the Government intervening would have been substantially negative.

Firstly, a price cap would dampen the signal for retailers to negotiate with customers, or to introduce tariffs to incentivise consumers, to save power in these types of unusual circumstances.

Second, it would remove the longer term incentive for customers to contract with private sector and SOE generators. More critically, the prices in contracts would be lower than they should be and the market would inevitably fail to invest in the new base load and reserve capacity necessary to ensure that, despite growing loads, future dry year events can be adequately managed.

By imposing a cap on prices, the Government would inevitably become involved in making decisions about new generation capacity and would start down the slippery slope of reverting to an electricity sector driven by political imperatives, as it was prior to 1987.

The market arrangements that have been put in place need to be given a chance to operate. Intervening with price caps, however temporary, would be the death knell to the competitive market which, over time, should produce the best outcomes for both consumers and the industry itself.

Was the call for moderate demand savings needed?

Although the Government rightly resisted the call to directly intervene in the market, it did act to assist the industry and consumers by convening industry meetings and promoting demand response. In late July the Government called for 10% demand savings for 10 weeks.

Was this a proper role for Government and was the 10% saving target really needed?

A purist might argue the Government had no role to play, since the spot market was clearly signalling the need to conserve power. On balance we consider the Government did have a valid role and the call for voluntary demand response was reasonable and responsible in the circumstances, although hopefully, after the experience this winter, the market should be able to elicit appropriate demand response without the Government being involved.

Although the spot market price signal was being delivered sharply to the retailers and generators, it had not yet been passed through to the majority of end use consumers in a timely or effective manner.

Consumers can and do respond in these events, and this response may be more efficient than building extra generation reserves that are used only rarely, provided that customers respond voluntarily by restricting only low value uses of electricity.

Infratil's manager, Morrison & Co considers this is an issue the industry needs to confront. The effectiveness of Government calls for voluntary savings will inevitably decay with time as profit driven motives are assigned to power companies. Morrison & Co thinks analysis of the 2001 crisis will also result in increasing cynicism by consumers.

Morrison & Co notes that new meters are not required for effective price signalling in New Zealand's dry year situation - monthly price signals are good enough and these can be provided with existing meters. The real question is, do generators really want to see this form of price signalling develop? With the vertical integration into retail, generation interests are clearly totally dominant. We suspect generators would rather encourage consumption and build power stations than have consumers respond. It takes standalone retailers to want to see products that allow consumers to help the retailer manage its purchasing risk.



Transpower's Role

The events of this winter highlighted a number of problems relating to the operation and governance of the national grid and its interaction with the wholesale market.

Transmission constraints

During the last few years transmission constraints have been occurring regularly as a result of outages and changing conditions in the market.

During 2000, constraints through the central North Island became binding on a regular basis when the new Otahuhu power station was out of service. This restricted trade across the grid and resulted in very high price differentials between the lower and upper parts of the North Island. A number of low cost initiatives for relieving this constraint were identified.

With the dry conditions this winter another set of constraints have emerged in the lower North Island, which substantially restricted generation from Taranaki and limited the flow of power from the North Island to help conserve hydro storages in the South Island.

As it turned out, the constraints were significantly relieved by simply and cheaply reconfiguring the transmission network. This reconfiguration did expose a small number of consumers to a slightly increased risk from transmission failure, but the cost of this was much lower than the benefits to the market overall.

Although it was clear there was a problem from May, the solution was not fully implemented until late July. This delay was a contributory factor to the falling lake levels in the South Island and to the increased market prices.

The solution could have, and should have in our view, been implemented much earlier, enabling Taranaki generation to operate at capacity. This could have resulted in hydro storage conservation equivalent to, perhaps, a 5% saving of demand. To put it bluntly, half the savings made by consumers were wasted by this delay which appears to have been caused, at least partly, by lack of clarity in Transpower's role and responsibilities.

Innovative and proactive action is needed to ensure that Transpower and the industry have contingency plans and procedures in place to promptly and economically deal with these occasional constraints. Attempting to deal with them when they emerge is too slow.

Black Hole Money or Transmission Rentals - The hidden bonanza of 2001

The design of the electricity market is such that very significant price differentials arise whenever transmission is constrained. The money derived from these differentials (known as 'black hole money' in Australia and 'transmission rentals' here in New Zealand) mounts up very quickly during dry year high price periods.

Currently, this money is collected by Transpower and given to lines companies. So a crisis, placing huge pressure on the retailers and users exposed to spot prices, produces a windfall gain to lines businesses.

This is nonsense. Some lines businesses pass the money to retailers, but others keep it as a nice little earner.

The rentals could be used to issue financial contracts to enable retailers and generators to hedge their exposure to price differential risk but, because they are not, the market is driven toward regionally balanced generation and retail businesses. This leads to reduced competition and greater monopoly market power on a regional basis.

Morrison & Co supports the concept of regional pricing. The problem lies with the unavailability of financial instruments for risk management and the lack of long term property rights for generators or retailers who contribute to new transmission investment. This creates risks for new entrants and raises barriers to entry in both generation and retail.

The industry has talked about this problem. A solution, involving the use of the transmission rentals, has been known for years. But Transpower is still consulting with the industry and implementation is not planned until next July. The industry has waited too long - this problem needs to be resolved immediately.

Morrison & Co believes these industry roles need to be taken away from Transpower, or Transpower needs to have a new Principal Objective added to its charter. This Principal Objective should be to "ensure there are minimal barriers to new entrant retailers and generators and that transmission structures support the development of a national market with the highest possible level of contract tradability". Transpower is, in our view, failing to deliver.

Current structure of the generation market is not serving New Zealand well



Morrison & Co believes concentration of generation ownership and the market power of the generators has not helped New Zealand with its dry year risk management this year.

In the electricity market, generators are able to offer their supply at any price they choose and are subject only to administrative compliance with the market rules and to the constraints of competition. In most situations competition is an effective constraint. However, there are circumstances when demand is high and supply is limited when the large generating companies can profitably restrict supply to the market and force prices up.

Although there is no proof of opportunistic abuse of market power, it seems likely the systematic rather than opportunistic exercise of generator market power materially aggravated the crisis this winter and created prices that were higher than necessary.

At the beginning of winter it was clear South Island hydro storage had fallen to historically low levels for that time of year. Under normal hydro management this should have resulted in spot prices rising sufficiently to induce all the reserve thermal plant to run and take market share away from the hydros, hence conserving hydro storage.

In fact, the reserve thermal plant on the system did not run at capacity until June and July. It is not clear why this delay occurred.

Transmission constraints may have contributed, but we suspect the main reason was the exercise of market power. It appeared that the back up thermal units were being effectively withheld from the market in order to drive prices higher. Another possible cause is that the hydro generators had to guess at the price the backup thermal plant would actually run, and they found this difficult to do since the bids into the market are all confidential. Morrison & Co believes this lack of transparency weakens the market's functioning and even encourages opportunistic bidding.

Although the causes cannot be known with certainty, we do know that if the back up thermal plant had been run at capacity much earlier in the winter the rapid fall in hydro storage would have been reduced, and the very high prices in July would have been averted¹.

This is illustrated in the graph below, which shows an estimate of what the hydro storage would have been had the thermal backup plant operated at capacity from 1 April. As can be seen this would have acted to bring hydro storage back towards more normal levels by July.

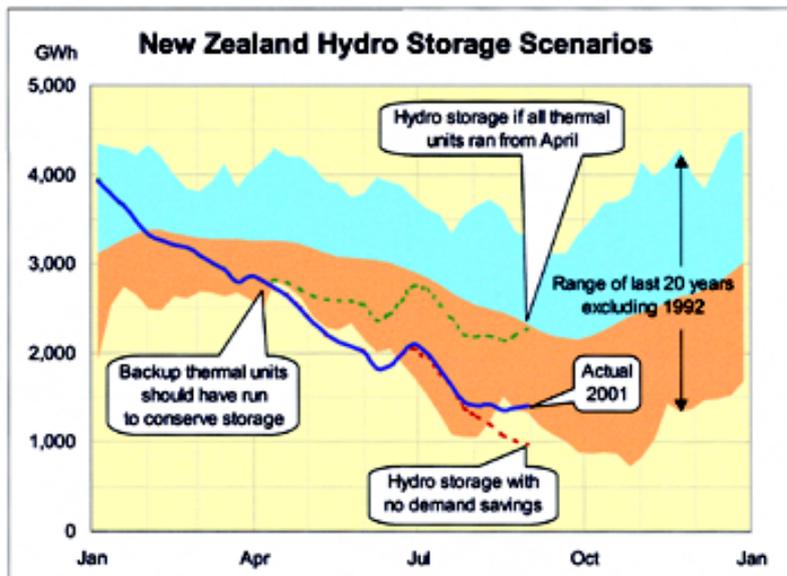


Figure 8: The 2001 crisis was aggravated by exercise of market power

To put this in perspective the graph also shows what the estimated impact of the 10% demand savings has been. While this is significant, it is much less than the impact of an early base loading of the marginal thermal plant.

The solution to the exercise of market power during shortages is largely structural. Rules and regulations are generally ineffective. The only reliable way to prevent this is to further break-up the incumbent generators.

¹ It is also likely that there were some limitations in supply due to transmission constraints, but this would be modest.

Where is the industry heading now?

The New Zealand electricity market was created to achieve efficiency through competition and specifically to get Government and the taxpayer out of underwriting commercial risks and to see competition replace regulation. The goals were:

- Ease of new entry into retail and a competitive retail scene with customers choosing the reliability they want through contracts and innovative tariffs;
- Ease of new entry into generation investments by providing secure access to transmission, access to a workably liquid contracts market and a fair spot market to buy backup power during plant breakdowns;
- Investment risks to be carried by investors rather than taxpayers or consumers; and
- Market and contractual mechanisms to co-ordinate the operational dispatch of generators to meet peak demands and provide good dry year security of supply.

The score sheet is struggling for a restricted pass mark, as evidenced by where the industry is heading:

- It appears we are heading to regionally balanced, vertically integrated, monopoly suppliers and little retail choice;
- The state and taxpayers are the biggest risk takers in the industry and this is growing all the time;
- Vertical integration is reinforcing generation dominance and limiting retail new entry and retail sector vibrancy; and
- The vitally important market liquidity (backup power for single plant owning new generation entrants, transmission risk management products, contracts for new retailers and consumers) is looking very much like an academic's illusion.

The common view is that you have to own generation at the same level and in the same region as you sell power or you will be eventually put out of business.

Infratil does not share this view. Certainly, competitive new entry on a single plant scale or as a small new retailer is a risky proposition. Notwithstanding this, Infratil has a view that an appropriately structured contract portfolio is not inferior for a retailer to physical generation ownership. In fact a firm quantity defined contract has advantages compared to the uncertainty in output of a hydro generator or the breakdown risk of a single thermal generator. A contract portfolio is also a much better match to a retail customer base, subject to attrition risks, compared with ownership of a 20 to 50 year asset.

Problems that need solving

The industry is failing to meet many of the goals set for it. Infratil summarises the problems as follows:

- We have forgotten why we created the market - to get the taxpayer out of taking risks (watch this space for who builds the next large generation project and who underwrites the next gas field!);
- Competition is rapidly disappearing in retail with vertical integration and fragmentation to regional markets; and
- Vertically integrated players are hugely benefited by the paucity of market liquidity that is vital for new entrants.

Infratil and its manager, Morrison & Co, are not alone in seeing structural flaws in the market. In early June the NZEM Market Surveillance Committee (MSC) raised concerns about the tendency for oligopoly and vertical integration in the New Zealand market, and how this can lead to undesirable trends. Their list of concerns is summarised below:

- increased barriers to entry into the market;
- relatively thin markets for electricity contracts, which are likely to be more asset and business specific and hence less tradeable;
- a less important role for the spot market for the big participants and hence the likelihood that small companies may perceive a risk of opportunistic use of market power and thus have less confidence entering the market;
- transmission constraints together with the lack of transmission hedging contracts and the inappropriate allocation of transmission rentals lead to increased regionalisation of the electricity market which can cause:
 - reduced competition for retail customers and electricity contracts in particular regions;
 - inefficient location of new investment and possible "stranding" of existing generation; and
 - less effective use of the national grid and reduced efficiency in dispatch of generation.

So what should be done?

Morrison & Co considers the market design itself is not fundamentally faulty, but that additional pro-competitive, pro-liquidity, structural reform is required to aid the market's efficient functioning.

New Zealand has consistently failed to make this a priority and has allowed entrenched self interest groups to dictate structures that reduce the market's competitiveness. It is probably too late to restructure Contact Energy, but we have the opportunity to improve things with the SOEs and with transmission issues.

Morrison & Co's prescription includes:

1. The State to divest its retail electricity businesses:

- It is difficult to see any compelling social or political rationale for the state needing to be involved in risky competitive electricity retailing business. This business simply involves organising supply and billing customers, it does not involve ownership of strategic national assets.
- All that increased state ownership in the sector does is to increase the conflicts and contradictions inherent in the state owning separate risky businesses which are in competition with one another. These conflicts make shareholder monitoring a very poor substitute for capital market pressures and will inevitably lead to greater risks of management capture, cross subsidisation, and electricity market distortions.
- Divestment would reduce vertical integration, increase competition in the generation and retail markets and increase contract market liquidity. It would probably involve a simultaneous sale of a declining portfolio of tradeable electricity hedges, so as to provide a starting risk management portfolio from which both the residual generator and the acquiring retailer could establish an ongoing recontracting strategy.

2. Require further divestment/separation of SOE generation assets:

- This would help to reduce market power problems.
- This does not require privatisation. If the Government chooses, it could simply mean more SOEs.

3. Establish transmission access security for generators and transmission cost hedging instruments as an urgent priority:

- This would help reduce barriers to entry into retail and reduce the current trend towards vertical integration and regional dominance.

Failing meaningful structural reform, Morrison & Co would like to see initiatives aimed at promoting confidence in the market and contract market liquidity as discussed above and summarised below:

- If the SOE retail businesses are not required to be divested, then they should be structurally separated and ring-fenced to assist shareholder monitoring of performance and to marginally assist contract liquidity and reduce the risks of cross subsidisation.
- Pro liquidity regulatory interventions requiring contracts to be standardised and more tradeable.

What does this all mean for Infratil's electricity sector investment?

In the short term Infratil can only be disappointed at TrustPower's profit warnings and its performance. Infratil looks forward to TrustPower's Board and management becoming more cohesive in its value and risk management focus.

The challenges of 2001 aside, Infratil does not view any ongoing fundamental weakness in TrustPower's industry position.

Rather, many of the structural problems in the industry are not actually detrimental to TrustPower's value. In many respects TrustPower benefits from being an established integrated generator and retailer and from higher prices.

Specifically Infratil sees:

- A period of lower retail market competitive intensity and rising retail prices.
- Some firming of wholesale prices and an inevitable flow through of these to end use customers.
- Some minor improvements in risk management flexibility for TrustPower through beneficial development of transmission hedges and regulatory actions to improve liquidity.

Essentially, TrustPower's value lies in its hydro and renewable energy wind developments. The value of these is driven by gas prices post Maui and by emission related costs for price setting new thermal power stations.

The sector risks that concern Infratil arise from state dominance and the unpredictable combination of nominally competing SOEs which are clearly capable of putting growth objectives in retail and generation above commercial criteria when, at the end of the day, it is the taxpayer who carries the risks.

Infratil is closely monitoring the sector's development and the Government's progress in responding to the issues of increasing vertical integration and state dominance.



Recent Developments

Glasgow Prestwick International Airport has continued to experience strong passenger traffic growth, with total passengers increasing by 39% in the five months to the end of August 2001. However, freight volumes are at lower than expected levels, increasing by 3% for the first five months of the financial year, reflecting the major downturn in freight volumes throughout Britain, but particularly in high tech products.

Ryanair has also announced a further 17% increase in aircraft movements from 28 October, with increased flights to London Stansted, Dublin and Brussels Charleroi.