large players as traders, many of whom have not been based in the Nordic region and have used--and still use--Nord Pool as a "training ground" for trading electricity markets elsewhere, and I do not understand the basis for the statement to the contrary. Unfortunately for the markets, however, many major players exited trading operations following the Enron scandal. The realisation of the level of risk present in these markets came late to some, and caused a market consolidation. In some ways Nord Pool is still recovering from this loss, compounded by extraordinarily high prices and volatility in the winter of 2002-2003, which further tightened players' grip on risk capital. All the same, Nord Pool welcomed 20 new members to its financial market in 2003, and see large institutions again looking towards the Nordic region. The growth of the German market has competed for traders' attention and will hopefully foster a healthy competitive environment.

Is Nord Pool the perfect electricity market? Far from it. As touched on here, liquidity and volumes have suffered due to lack of risk capital and high volatility. The need for a variety of traditional and untraditional products spread liquidity more than it might for conventional commodities. Some issues not discussed here are equally important: taxation, lack of investment, end-user issues and environmental concerns. But both the Nordic market as a whole and the Nord Pool exchange have withstood the test of time. Rather than declaring this a failed experiment, we should work to continuously improve on what is by several measures a success.

Endnotes

1 Hull, John C., *Options, Futures, and Other Derivatives*, Fifth Edition, Prentice Hall, 2003, pg 75.

Electricity Market: Price Volatility No Flaw

By Tony Baldwin

When electricity spot prices spiked recently, the Major Users Group (which includes Comalco, Carter Holt, Pan Pac Forest Products and Winstone Pulp) protested: "The market is inherently flawed. Generators are price-gouging."

It is an easy catch-cry, but closer analysis shows the Major Users are likely to be wrong.

Over the weekend of 9 January 04, a section of the main North-South transmission line was blown over in a storm. Cheap hydro electricity from the South Island was temporarily unavailable in the North Island. In addition, some power stations in the North Island were out for maintenance. The result was a temporary power shortage in the North Island.

Spot prices in the North Island jumped sharply. For five hours on 12 January, prices spiked from 3c to $1.04 a unit. However, as soon as the damaged transmission line was repaired and hydro electricity from the South Island could once again flow north, North Island spot prices dropped back to around 3c per unit.

Spot prices jumped for two reasons. First, to reflect the higher cost of generating replacement power in the North Island. Second, to ensure that total consumption reduced to equal available supply. In any electricity system, supply and demand must always be equal.

The last units of available generation capacity are typically offered at high prices. This signals that supply is about to run out. For example, in December 03 the last increments of supply from Huntly (gas-fired) and Clyde (hydro) were offered at $2 a unit.

Generators are unlikely to have jacked-up their prices to exploit the temporary shortage. Publication of their pricing schedules is expected to show they were consistent with prices offered before the transmission outage occurred.

In short, the spot market worked well. The Major Users' claims appear to be unfounded. Volatility is an inherent part of an efficient electricity spot market. It is not a flaw.

The flaw is failing to hedge against it. Purchasing power on a fixed-price contract avoids spot market volatility.

Too many large electricity buyers appear not to understand price risk in relation to electricity. They do not seem to have digested how and why prices move, and do not accept that volatility in power prices is a business risk, like interest and exchange rates, which they have to manage – not the Government.

Generation costs vary dramatically. Key drivers are fuel costs (oil is more expensive than gas and coal), scarcity of water (the value of hydro increases sharply in 'dry periods'), transmission constraints (congested power lines can isolate some generation capacity) and consumer demand which varies with the time of day, weather and changing levels of economic growth.

The purpose of a spot market is to ensure that cheaper generation is used ahead of more expensive sources.

Many people believe the notion of an electricity market is simply a misnomer. No doubt, Jane Clifton spoke for most in saying: "…the mischief lies in the idea that electricity can be marketised...a benevolent, efficient state monopoly would be preferable." (*Listener,* May 2003)

Certainly, many Major Users prefer Government-controlled electricity systems as they find it much easier to win taxpayers subsidises in their power prices.

The main reason for moving to a market is *to* improve economic and environmental performance. Corner-stone aims include more efficient investment in new generation, and electricity consumption based on efficient price signals. The old government monopoly fell well short on these objectives.

Over the past 15 years, a standard model has emerged around the world. Professor Stephen Littlechild, the former regulator of the UK electricity market, points out that it has

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five essential elements:

- A separate transmission company, which may be privately owned, providing non-discriminatory access;
- Privately owned and competing generation companies bidding into a spot market;
- Privately owned distribution networks providing non-discriminatory access;
- The retail market open to competition; and
- An independent regulatory body.

New Zealand's electricity market design is consistent with this model, which has been applied in the UK, Australia, the USA, Sweden, Norway and several other countries.

On a technical level, our spot market is leading-edge in the world. Indeed, as Professor Bill Hogan of Harvard University has observed: "…the NZ electricity market design has been at the forefront of best practice…[and] involved extensive consideration of the experience of other countries."

Overall, the NZ market is still in transition. It has underperformed in several areas. Government-owned generators have failed to cross-hedge. Generators have vertically-integrated (balancing their output with retail customers), which has reduced their incentives to offer hedges. Major Users have been reluctant to purchase hedges. There is no competitive market reference point for longer-term electricity prices. And the retail market is less competitive than it could be.

These weakness are caused by five missing key elements. The first three are:

- A liquid market for buying and selling electricity hedges;
- An efficient demand-side response mechanism; and
- A financial mechanism for hedging against transmission constraints;

With careful guidance from the new Electricity Commission, these absent elements can be mitigated. While the Commission's potential powers are extremely wide and, if used unwisely, capable of imposing net costs, the Commission's new role also creates an opportunity for positive action that industry division has previously prevented.

Daily Average NZEM Haywards Reference Price
1 October 1996 to 23 November 2003