Even better than ripple control?

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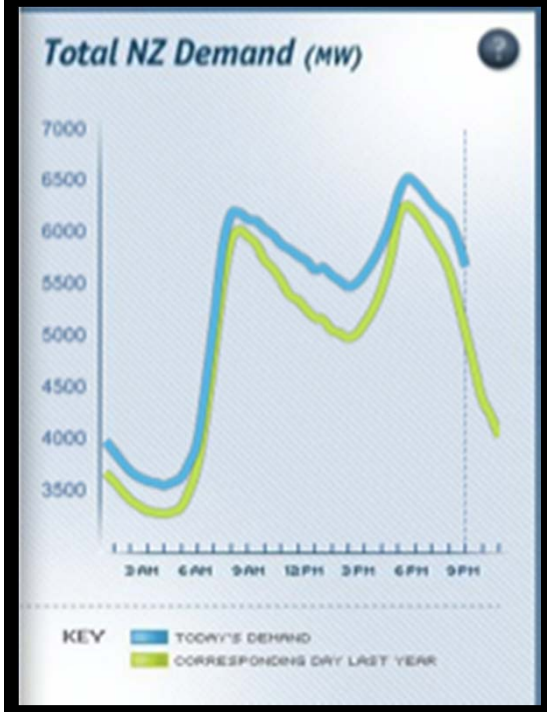
Ripple control

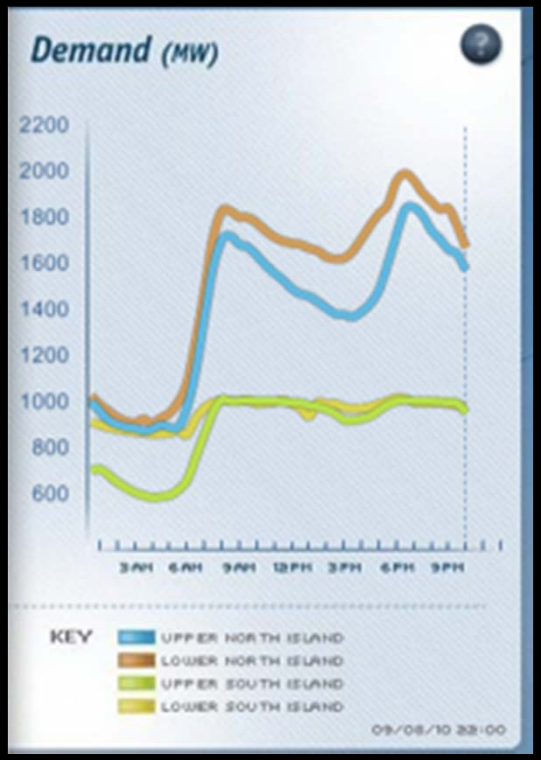
- Before the electricity reforms….
  - effective demand side management
  - huge savings to the consumer
- Then came the reforms that did not allow lines companies to recover the cost of managing demand…

The current situation



Distinct morning and afternoon peaks have returned

Demand is ~500 MW higher than it needs to be



The upper South Island continues to use ripple control.

North Island lines companies obviously abandoned it.

Other problems..

- This is not an uncommon scene
- In an efficient market, when the demand goes up, the price goes up and demand backs off
- Can anyone explain how we get all these wiggles?
- My smart hot water relay couldn’t fix this!

The reforms

- Spawned a regulation that forced lines companies to pass through all of Transpower's charges
- Most lines companies ran down their ripple control systems
  - and made a profit..
- The upper South Island maintained its ripple system

An even smarter relay

- Current ripple relays can switch groups of water heaters off and on
- A presentation at a recent conference spawned the idea of a truly smart hot water relay..

Smart ripple relay

- Plug-in replacement for the thermostat on a conventional electric water heater

- A version without the temperature sensing could control other loads.

What it can do..

- Transpower and the lines cos
- The retailer
- The consumer
- Replace spinning reserve
- Reduce the need for AUFLS
- Solve the over frequency problem
- Limit price spikes
- Limit constraint problems

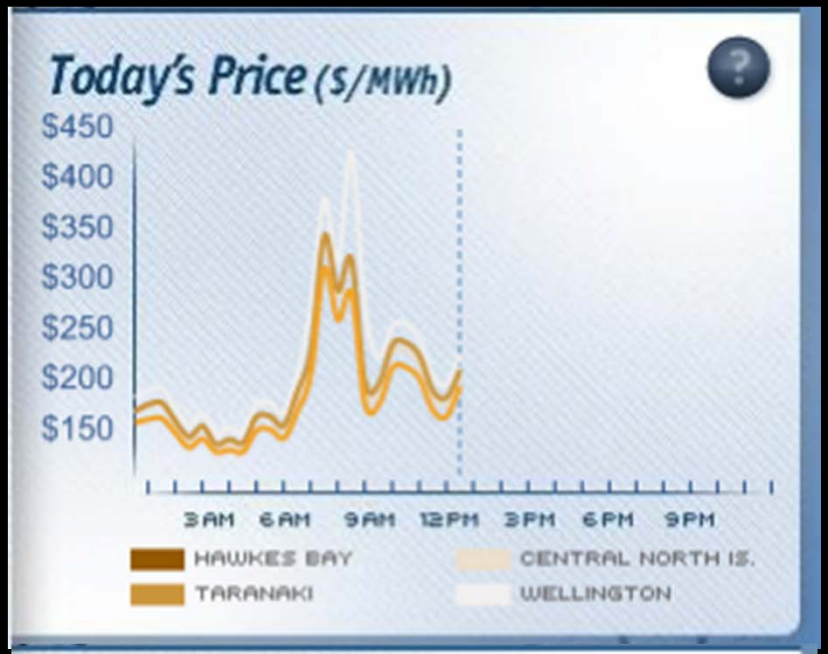
The potential savings are enormous!

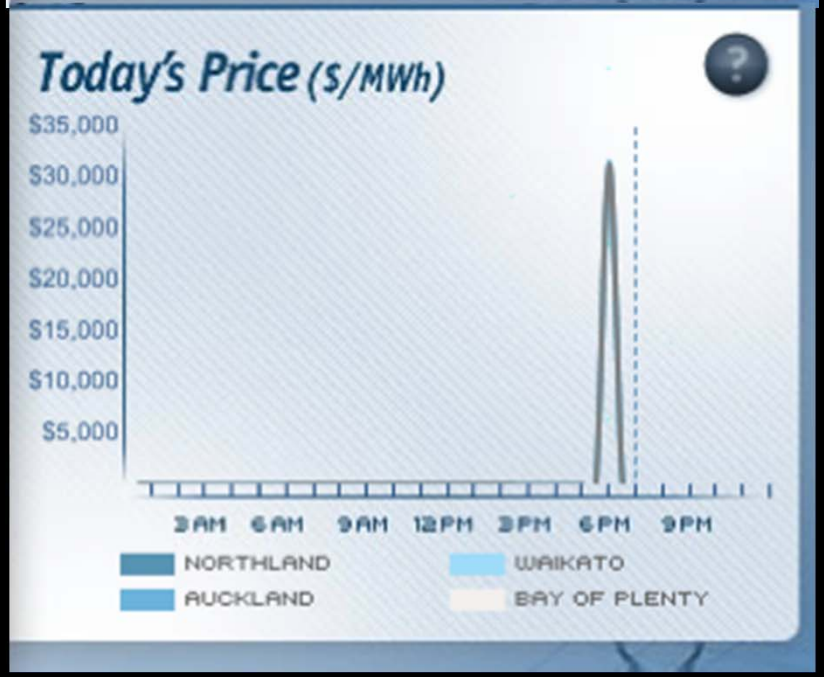
Frequency management

- It could operate over a range of +/-0.0 5 hertz relative to 50 cycles
  - The biggest load diversion governor in the world!
  - Control ~800 MW little need for
    - frequency management
    - spinning reserve
  - All for virtually no cost!

But the generators may not be pleased…

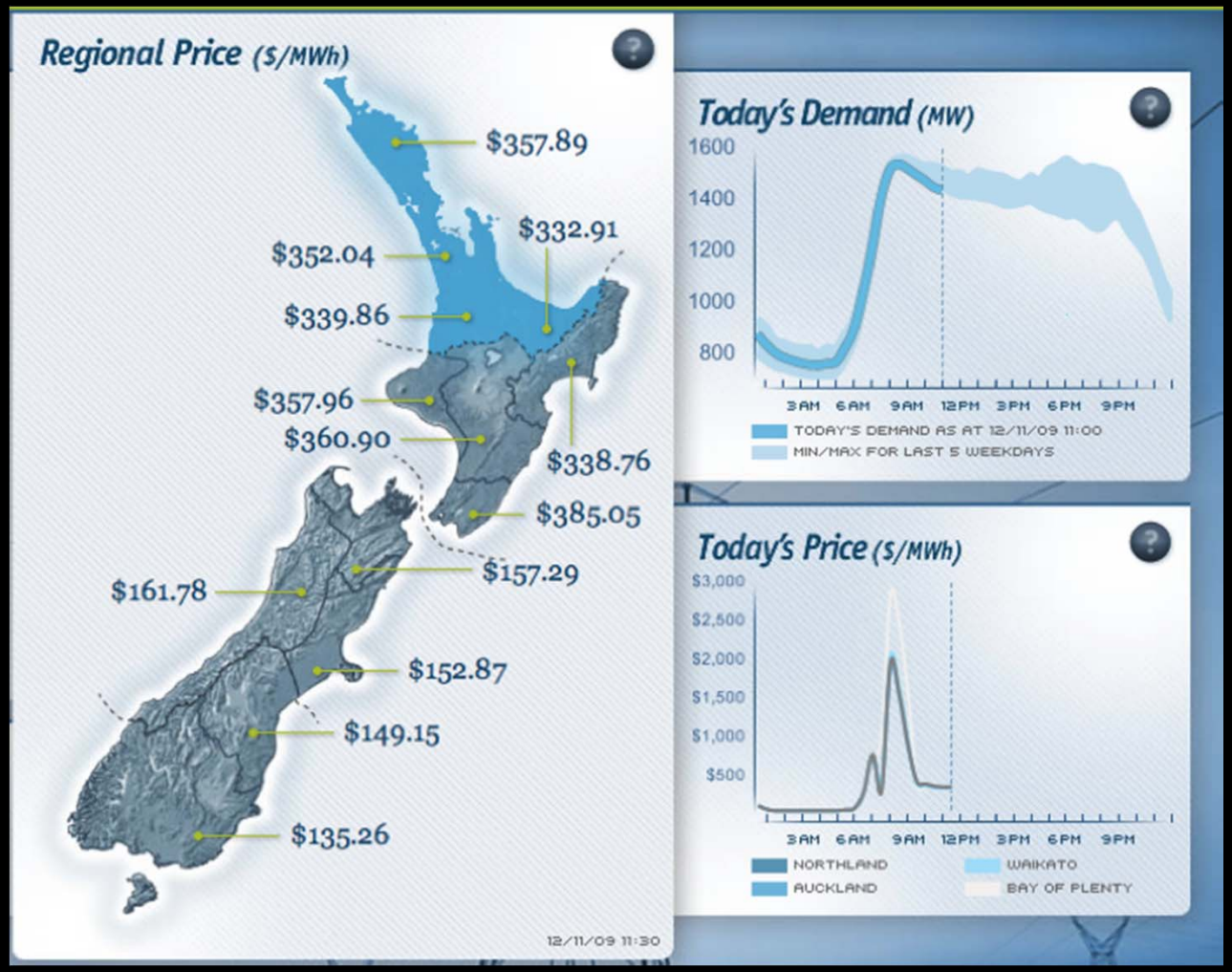
Managing price spikes





- Sometimes we get price spikes that last only a few hours
- It would be easy to dump load rather than starting up expensive reserve plant
- And benefit everyone but the generators!

Manage transmission constraints



- When a constraint occurs, it would be easy to dump load in the affected area
- But the generators might not be happy…

Security

- The big risk is, of course, the Wi-Fi connection
  - the same for smart meters
- Hackers
  - cold water
  - or crash the system
- Security is important!

Who benefits?

The consumer

Transpower

System operator

The lines companies

Generators

How do we aggregate the benefits?

- Under the present regime, there seems to be no way to do this

The Electricity Authority insist that there is nothing they need to do!

- One organisation should aggregate all the benefits
  - How?
    - The lines company
    - Transpower/system operator
    - The retailer
    - The consumer

What could be done?

The simple option

- A load that can be controlled without you noticing it must be it available for load control
  - less Draconian than the current AUFLS regime
  - Relays funded by Electricity Authority levy
- All consumers would benefit
- No chance it will happen
  - “consumer choice” is rated higher than consumer benefit

What could be done?

A more complex option

- consumers with relays pay less
  - two different tariffs
    - for those with and without relays
  - But how would you get lines companies and generators to sign up?
  - Who funds the installation of the relays? The consumer or????

I suspect it would finish up being an administrative nightmare with endless arguments all aimed at minimising the apparent benefit

The perfect solution?

A single buyer market

- It would be obvious to the single buyer that it would be a major contributor to a “reliable and economic supply”
  - So he must get on and do it
- The consumers would be delighted
  - it would have no significant effect on the profits of the other players..

But a single buyer is heresy of the worst sort!

Questions…