

Deeper Connection Options and Efficiency Considerations

April 2011

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Why extend beneficiary approach deeper?

- To incentivise participants to provide good quality information to the central planning investment process and promote commercially-driven investment where possible.
- Provide incentives to defer reliability-driven investments when it is economic to do so.
- May be a better method to deal with boundary issues between connection and interconnection?

Options

- Flow Tracing:
 - Allocate shares of some interconnection assets to companies according to a flow trace methodology. They receive rentals on assets they pay for.
 - Methodology has been prototyped and tested to an extent.
- But - For:
 - One-off identification of the “beneficiaries” of new “deep” connection assets when these are approved under the GIT
 - Involves similar process and issues discussed in beneficiary pays on core grid.
 - Maybe a forecast Flow Tracing approach could be used as proxy?
 - Beneficiaries only pay for capacity that they require, but Transpower could build more and socialise cost;
 - They would receive rentals for share of investments they pay for.
 - Only if possible to identify beneficiaries at reasonable cost.
 - Very little work has be done on this option.

Flow Tracing - Design

- Load and/or generation
 - Trace back from loads and/or generation – average participation factors
- Assets excluded
 - Exclude assets already accounted for in TPM e.g. connection, deep connection, new investment agreements, HVDC, but-for agreements etc.
- Asset cut-off - Asset Concentration Index: ACI – Deep (>4k), middle (>6k), Shallow(>8k)
 - Exclude interconnection assets with ACI index? Definition of ACI; based on GXP or distributor, avg annual or half hourly?
- Measurement period
 - Flow shares assessed each half hour and aggregated over a year.
 - Could be simple average, peak periods etc.
- Allocate rentals?
 - Actual rentals or shares of FTR residual auction revenue?

But-For : Design

- Identify the “beneficiaries” of new “deep” connection assets when these are approved via GIT.
 - Also apply to historical assets?
- Enter long term contracts with Transpower?
 - How long, performance promises?
- Commerce Commission approval of contracts or allocation?
- Would this replace or be an alternative to existing deep connection?

Submissions

- 3 large users wanted more work on “**but-for**” and saw similarities with flow trace
- Contact, EECA and Meridian wanted more work on **flow trace**, Todd Northpower and Transpower did not support it.
 - Issue re complexity, legality, audit ability, instability, threshold distortions, unclear benefits, does not consider ‘stand-by’ assets, contractual issues

Possible approach?

- Have Flow Trace as back-stop methodology for offtakes, and existing deep connection as back-stop for generation
- Parties (or groups) can “opt-out” by agreeing a “but-for” allocation or a new investment agreement with Transpower.
 - Assets associated with these separate arrangements are dropped from the flow-trace.

Efficiency considerations

Location price signalling	Signals increase in Transmission charges arising from new grid investment. Ex-ante incentive for load control or generation to delay new grid if cheaper. Will depend on CC treatment of these costs compared with Transmission. Incentive to do “commercial” deal with Transpower?
Economic distortions	Ex-post allocation of fixed costs to load relatively hard to avoid? Reconfigure networks or companies or fund local generation to influence FT allocation or ACI cut off ex-post. [Fix by using regions rather than coys?] Reduces RCDP charges for residual interconnection? Game TA regime?
Beneficiary pays	Flow allocation \neq benefit – probably OK for distributors, not as good for direct connects or generation. Distributors who pay for new grid investment have incentive to provide accurate information and consult.
Good regulatory process	Significant value changes in some regions \pm \$10-\$30/MWh. Transition by lowering ACI cut-off over time? Variations with hydro/demand \pm \$3-6/MWh
Simplicity & workability	FT could cost \$2m + \$0.5m/yr – to run and operate (including users)? FT reasonably objective and workable once setup?

Locational signals

- Nodal pricing may provide inadequate locational signals to defer “reliability” investments
- Want to provide an additional locational signal to take actions to defer/avoid lumpy grid reliability investments
 - Can respond with demand side & “locate-able generation”
 - Eg 400kV & NAaN – provides a \$10-\$20/MWh additional signal
- Flow Trace may be better here
 - Strong signals to delay ex-ante but hard to avoid ex-post.
- TCDP pricing provides an ongoing signal to manage peaks.
 - Ok for “smooth” investments, but not so good for lumpy investments – weak ex-ante, stronger ex-post signals

Interaction with Transmission Alternatives

- The TA regime provides payment for demand management and possibly local generation to defer reliability investments.
- The distributor who pays (via FT) has an incentive to offer TAs for which it will get paid for (and will pay).
- This does not seem to provide a “gaming” incentive, but does provide an incentive for distributors to promote and facilitate local TAs, if the cost is less than they would be allocated for a grid reliability investment.
- Would distributors enable more lower cost TAs than Transpower?

Comparing options – indicative only

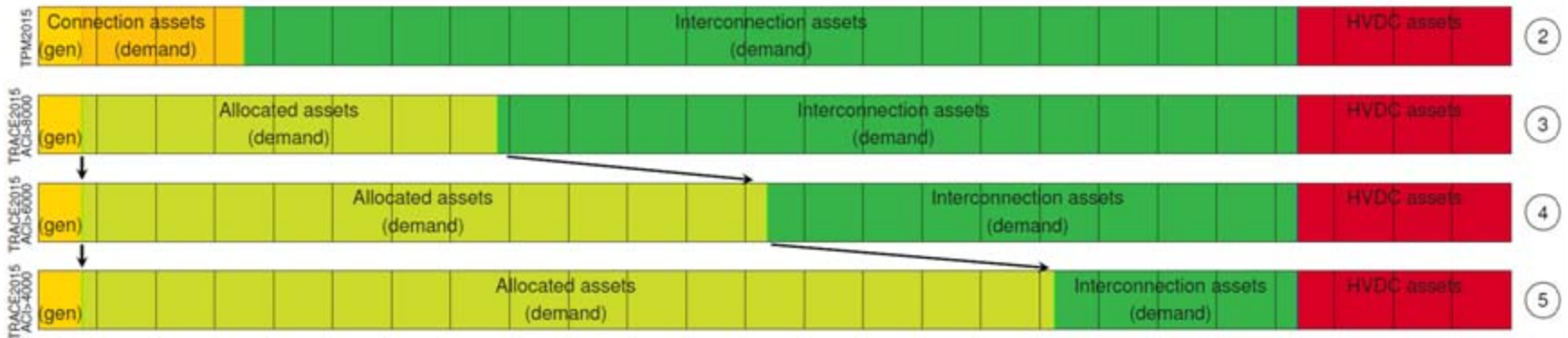
Deeper Connection Charges		Flow Trace	But-for
Location signals – new grid investments		✓	✓ ✓?
Minimise economic distortions?		Reduces RCDP Game cut-off?	Reduces RCDP Game allocation
Beneficiary pays?		✓	✓ ✓
Good regulatory practice?	Consistent treatment across network?	✓	✓?
	Wealth transfer?	±\$10-15/MWh	Lower if only applied to new
Simple and workable?		Complex \$2m +0.5m setup?	Complex Hard to set benefit shares ex-ante?

Critical Issue

- Do efficiency benefits justify the wealth transfers involved from the Status Quo?
- Would providing a signal to distributors/DC achieve more efficient investment in grid, locate-able generation and demand-side than Transpower using TAs regime alone?

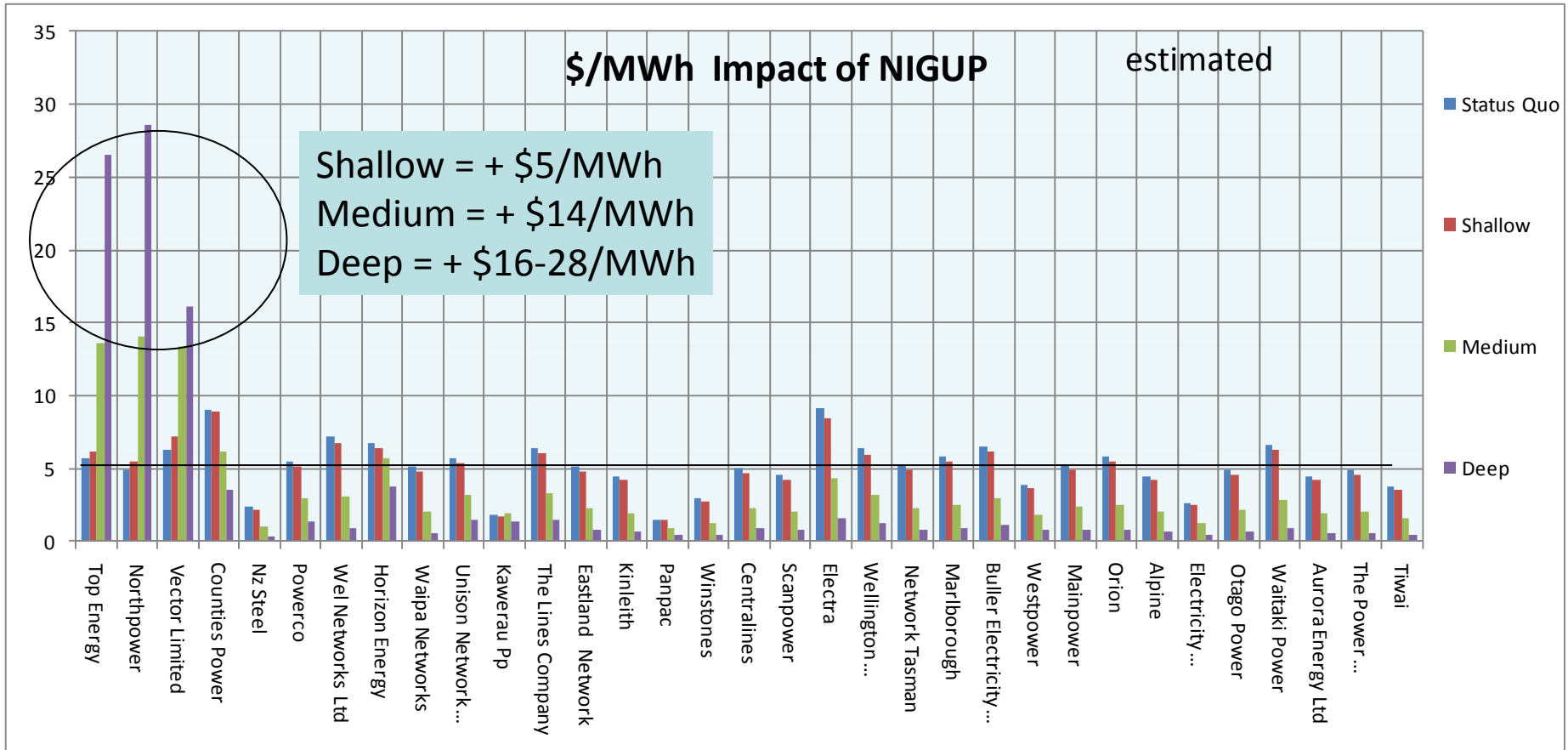
Additional Slides

Impact of cut off on Interconnection



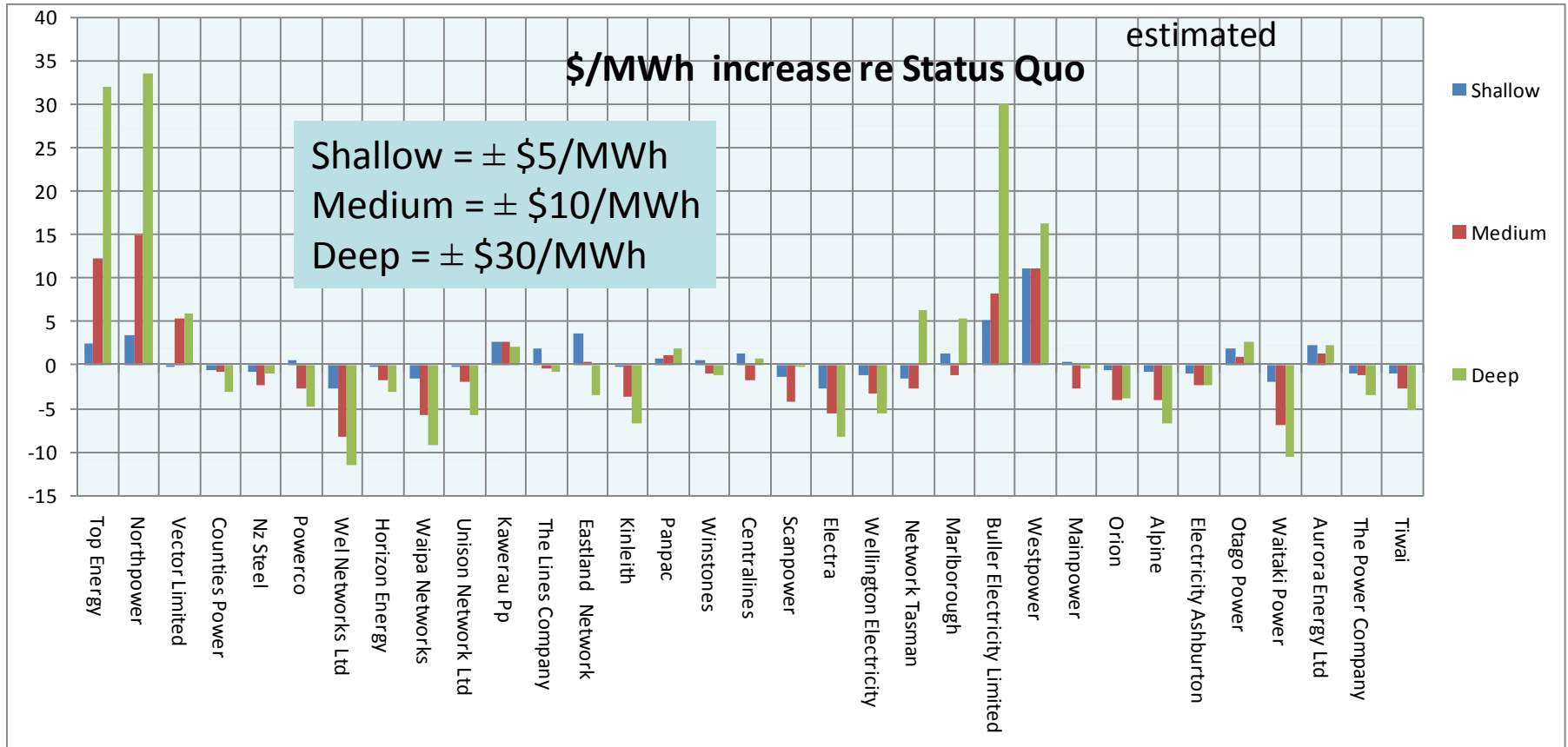
	ACI Index	Pct Interconnection
Status Quo		86%
Shallow	>8000	67%
Medium	>6000	43%
Deep	>4000	24%

Impact of “400kV/NaAN ” if FT was in place 2015

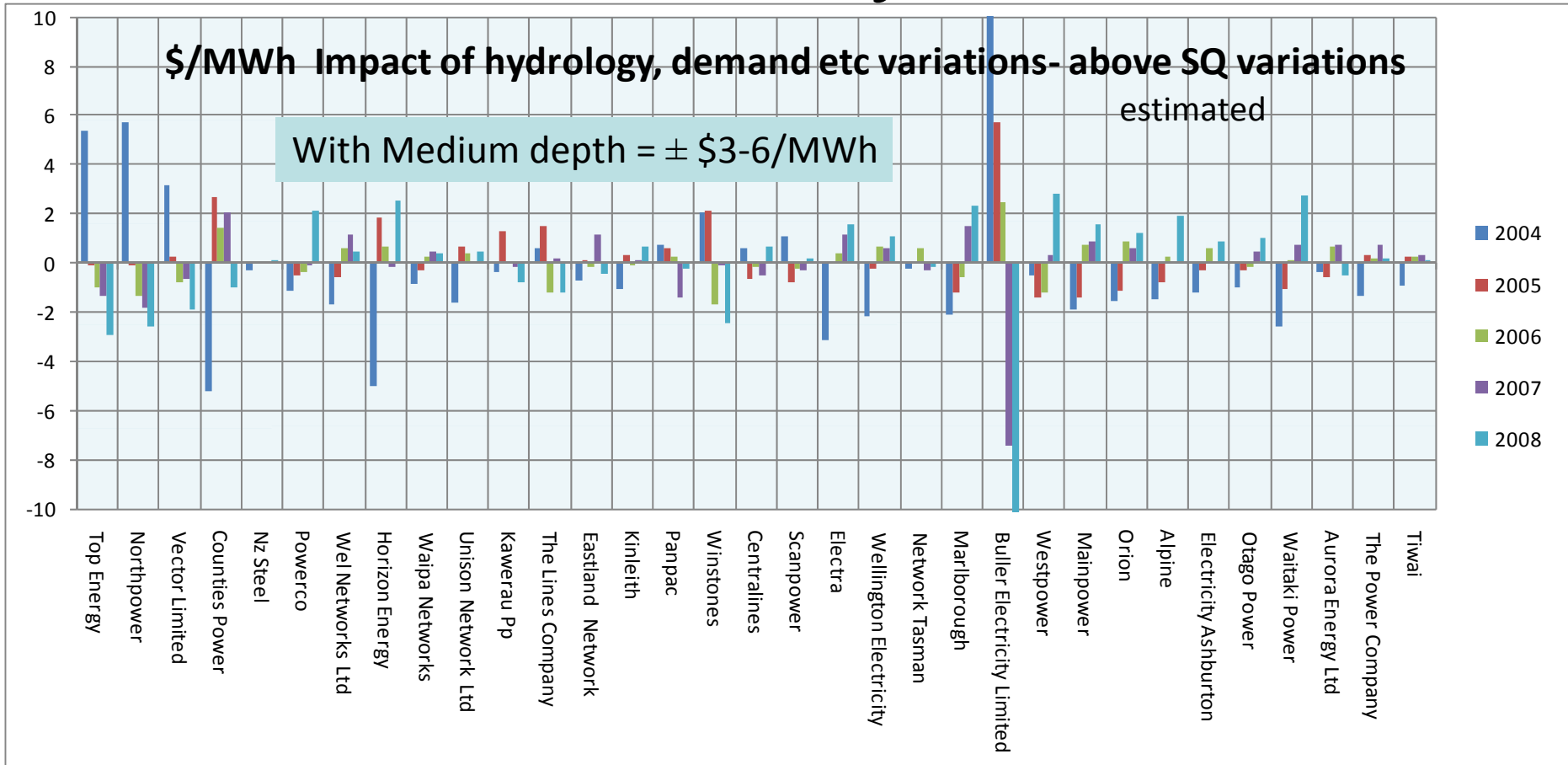


This is a measure of the Locational Signal – prior to major NI grid investments

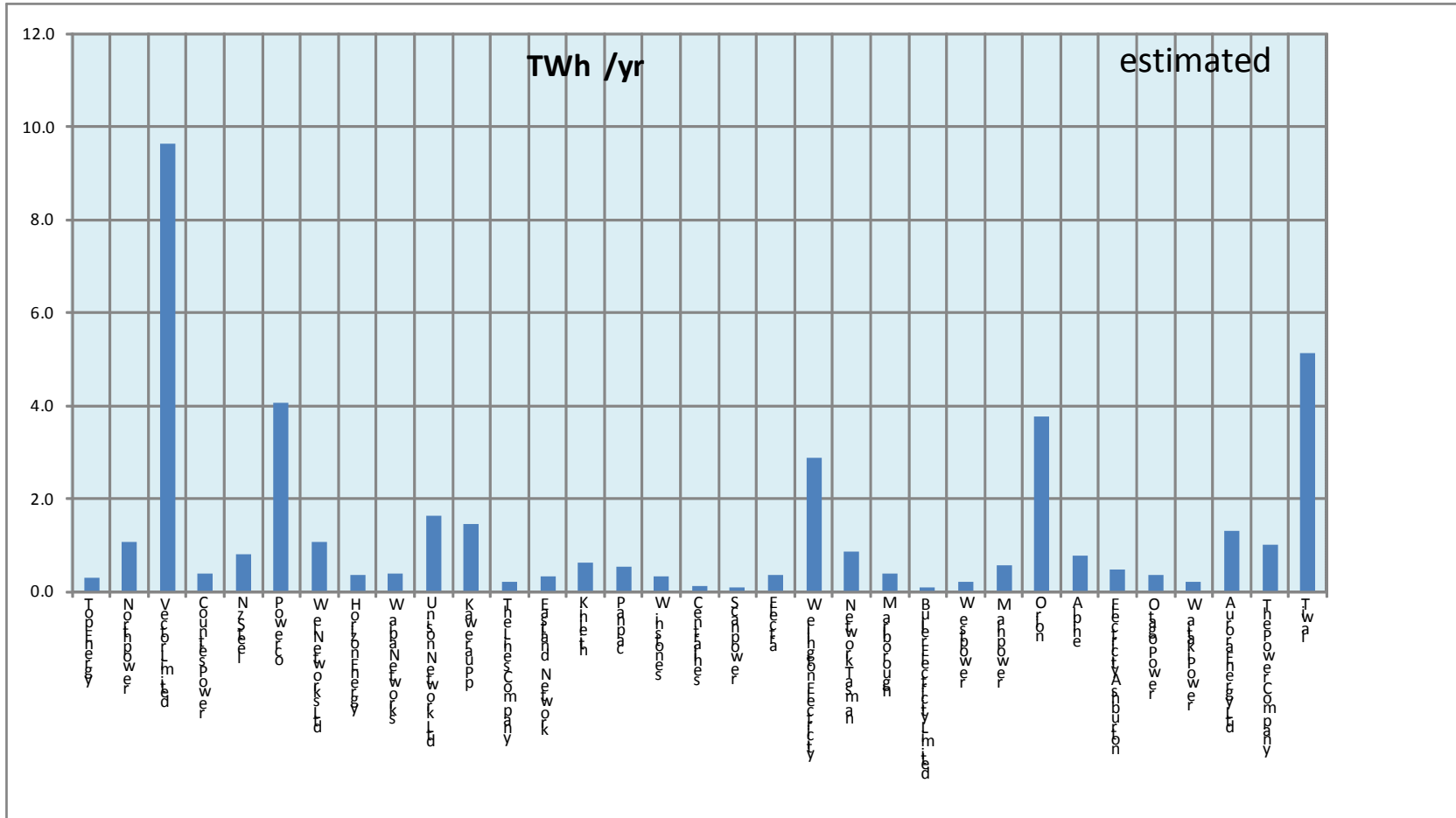
Value Changes from SQ 2015



Price Stability - 2015

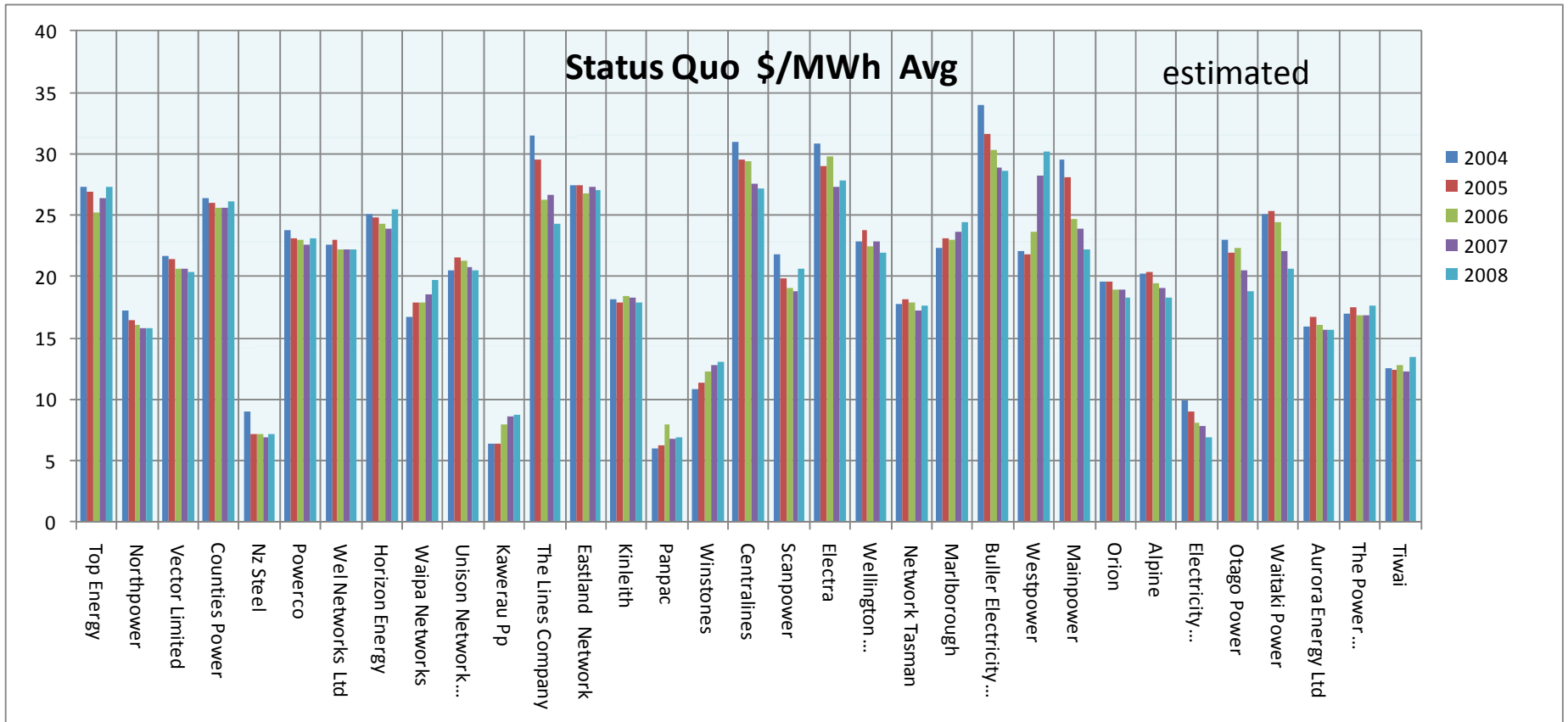


Total GWh – 2015



Biggest – Vector, Powerco, Wellington, Orion and Tiwai

Status Quo \$/MWh 2015



Note some volatility in Status Quo – RCDP load factor driven ?

Other Issues

- Integration with other pricing:
 - Can accommodate notional embedding - yes?
- Flow does not reflect value very well?
 - Stand-by assets, service, load versus generation value, differing reliability levels.
- Other unintended impacts are likely in special cases?
 - Consequences of major load changes, new generation
- Others ??