

RENEWABLES ADVISORY

NZ Wind Energy Market Outlook

Gloom or Bloom

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Public

Overview

- Intro to DNV GL
- There is plenty of pessimism surrounding electricity generation developments in New Zealand, but is this really justified?
- Today I'll look at my view of the short, medium and long term outlooks for further wind energy development in New Zealand.

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There sure is plenty of pessimism going around...

- MRP “unlikely to build a new large power station here in the next three to five years”
- Meridian “unlikely that Meridian will commence additional development projects in the short to medium term”
- Contact “oversupply of generation ... led us to exit our HMR project ... not to proceed any further in the foreseeable future with our Waitahora development”
- Genesis “we have no plans to construct new assets in the intermediate future”
- Trustpower “The market for new generation is stuffed at the moment.”

There's plenty of uncertainty going around too

- The future of the Tiwai Pt aluminium smelter;
- Transmission pricing (TPM, ACOT and HVDC);
- Labour-Green NZ Power plan;

Electricity Demand

- Electricity demand has been declining since 2010 and in 2012 was 3% lower than 2010 levels.
- Economic recovery is starting to get underway, but will electricity demand follow? Electricity demand has also been flat/falling in Australia, Europe and the US – Is this the end of demand growth in western economies?
- Do structural changes in the economy mean that electricity demand will continue to fall?

Electricity Supply

- Thermal generation plant is being taken out of service; a significant rebalancing of thermal electricity supply.

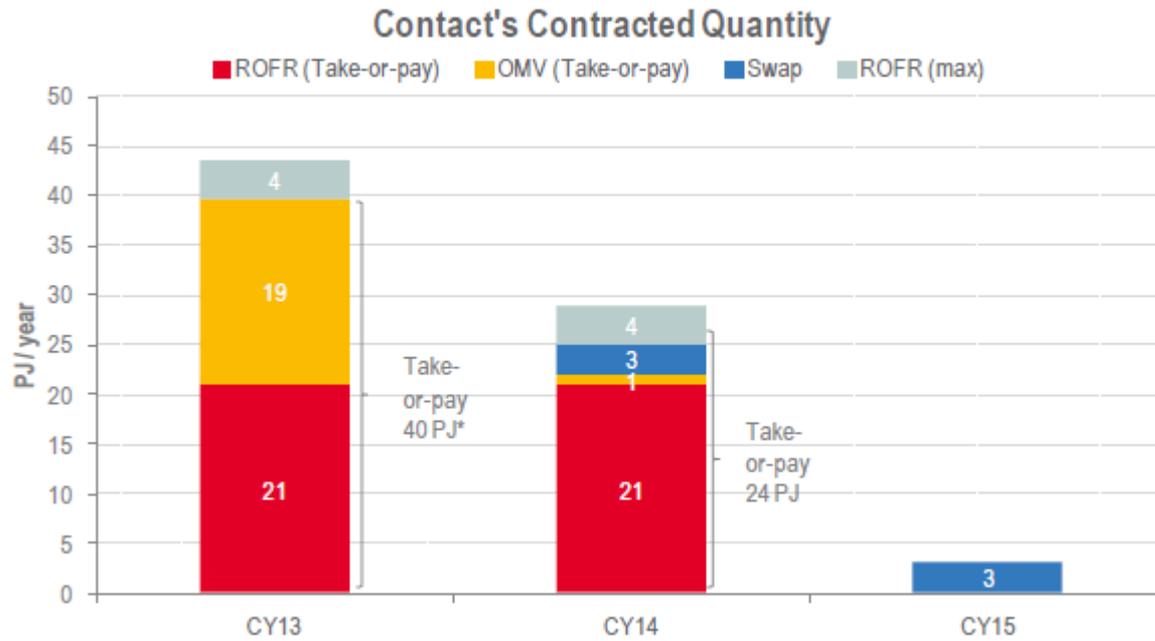
Genesis

- Has mothballed one 250 MW Huntly unit
- Decommissioned another 250 MW Huntly unit
- terminated a coal supply agreement.

Contact

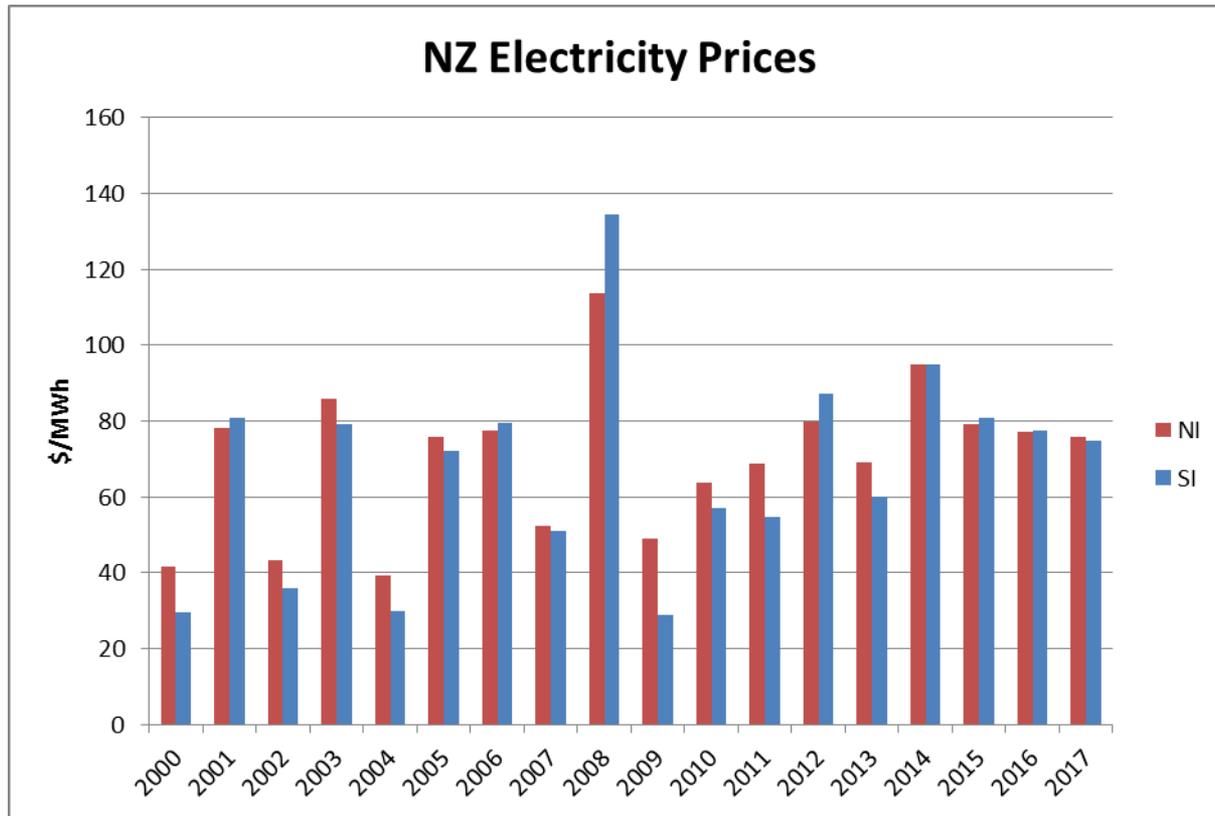
- Has stated that the 377 MW Taranaki Combined Cycle power station is unlikely to run in winter 2014 (though it has been running recently)
- Has deferred major maintenance on its two combined cycle plants
- Has significantly reduced gas contracts for 2014 and 2015 compared with previous years. This equivalent to ~2000 GWh less than historical average for 2014 (~5% of NZ generation) and ~5500 GWh for 2015 (~13% of NZ generation) if we assume a typical CCGT efficiency.

Contacts Contracted Gas Volumes



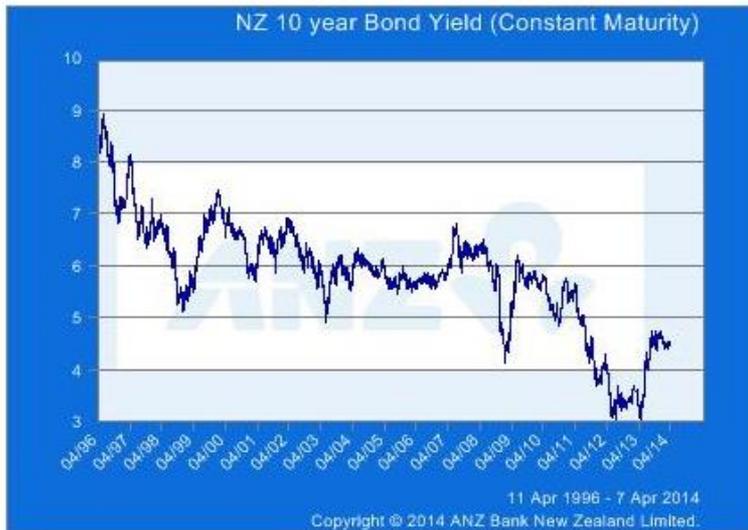
Electricity Prices

- Despite market expectations of a “glut” of electricity generation, wholesale electricity prices have (at the most) softened rather than collapsed.



Wind has (arguably) never been cheaper in New Zealand

- Wind turbine prices have fallen.
- Wind turbine technology has improved.
- The NZD is strong.
- Interest rates are low.



Disclaimer

Wind Turbine Technology Improvements

- Turbine platform that began as Bonus 2.0-76 now available as Siemens SWT2.3-108.
- 15% increase in rated power.
- 100% increase in swept area
- Sweeps 9160m² – that's 1.3 rugby fields
- At 9 m/s almost 100 tonnes of air per second will be passing through the rotor
- The turbine will extract 45% of the kinetic energy in that air, generating 1.8 MW of electrical power.
- Other manufacturers have also increased swept area on their platforms – e.g. Vestas V110-2.0 MW, GE 1.6-100.
- More turbines in a platform range means not only are turbines selection optimised for sites, but also within sites.

Thermal Generation Economics

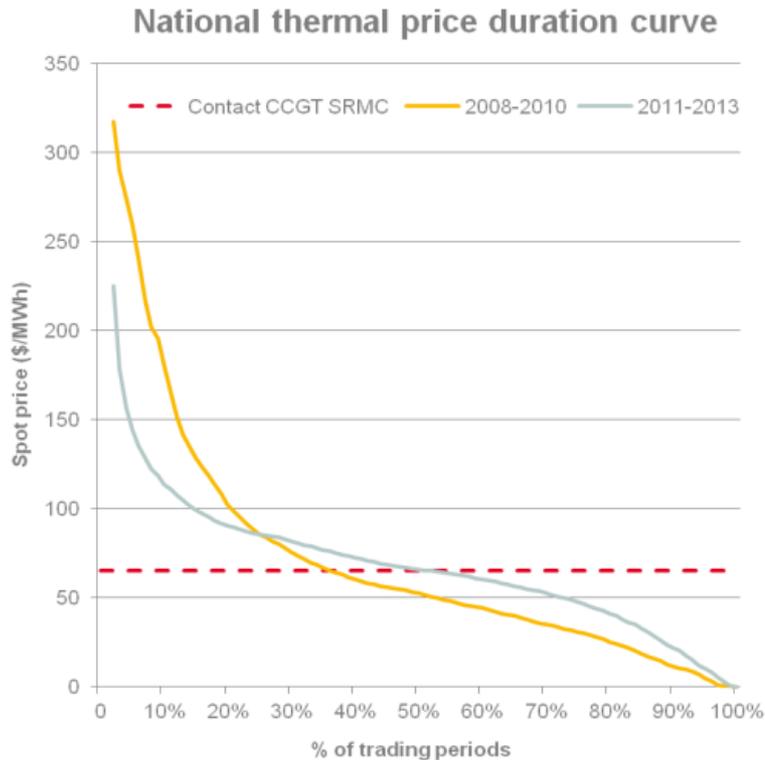
- Assuming a gas price of \$7/GJ the fuel price for generation is approximately;
- \$50/MWh for CCGTs
- \$70/MWh for peakers

- The above is the fuel cost only, and might be considered to be the short run marginal cost. Actual SRMC may be lower than this if the generator has inflexible fuel contracts (e.g. take or pay) which make the marginal fuel cost low.
- Thermal generators need prices to be higher than this to remain in business (operation and maintenance, refurbishment, etc) – I'll term this the medium run marginal cost.
- Given that electricity price expectations are in the \$70-80/MWh range, while thermal plant is being mothballed or having major maintenance deferred suggests that the medium run marginal cost of existing thermal generation is also in this range.

Don't just take my word for it – Contact 6 month presentation

Poor thermal returns require flexibility in fuel and maintenance commitments

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- Historic thermal generation shows plant running below short run marginal cost of a CCGT more than 50% of the time
 - » CCGT utilisation 41% 2011 – 2013, down from 47% 2008 – 2010 with the addition of new baseload renewable generation
 - » Capacity margins earned above SRMC reducing over time
- Market is responding by withdrawing excess capacity and reducing fuel commitments
 - » Contact has not contracted additional gas and expects to not require TCC during winter 2014. No fuel currently for CCGTs in 2015
 - » Genesis has reduced and extended its coal contracts with second Huntly unit placed in storage

Results for the 6 month period ended 31 December 2013

Thermal Generation Economics

- Interesting phenomena this February;
- Hydro levels ~120% of normal at a low demand time of year, yet weekly average prices >\$100/MWh.
- Contact's CCGTs not operating. "Market conditions and fuel positions haven't supported us running Otahahu"
- MRP's Southdown cogen/peaker also offline "At the current market prices of about \$100 a unit, Southdown did not make money"

Short term opportunities

- Despite the FUD, there are still opportunities
- Brave counter-cyclical investors who recognise that electricity generation is a long term investment and want to take advantage of favourable turbine pricing and exchange rates.
- Behind the meter and small wind farms like Energy3 at Grassmere, irrigation energy supply?
- Net electricity purchasers who would like to perpetuate the current “oversupply” and low electricity prices, and “lock in” a component for the long term.

Medium Term Opportunities

- If electricity demand picks up then wind is in pole position to meet a large portion of the growth.
- Large number of consented sites.
- Wind can be developed quickly.
- Wind is cost competitive with other forms of new generation.
- Even if demand does not pick up, if wind can be built for approx \$80/MWh it could displace existing thermal generation.
- 20% wind by 2030 is still very achievable.

Potential Game Changers

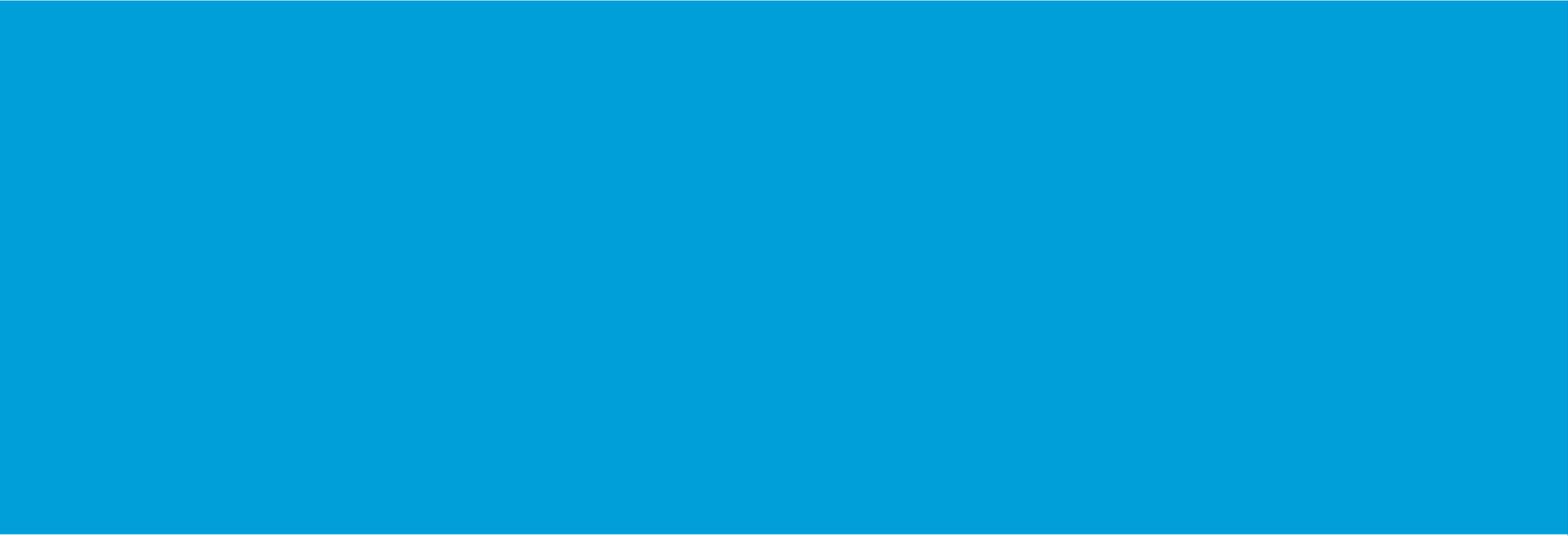
- Electric Vehicles – these could increase electricity demand and flatten the load profile, easing the integration of renewables such as wind (or they could contribute to peaks if the incentives aren't there). Electricity industry as a whole should be thinking about EVs and the opportunities that they bring. Smarts and comms are in the vehicles already so it may just be a case of taking advantage of these. For NZ as a whole EVs will bring renewable energy to the transport sector.
- Solar PV – is at or approaching “grid parity” with retail electricity now. Unlike wind, PV can generally compete with the delivered price, not wholesale price of electricity. Solar PV may represent a de-facto price cap on the delivered price of electricity and thus affect retail, network, transmission as well as generation. The potential for democratisation of electricity generation brought by PV could profoundly change the industry as a whole.

Summary

- Even in the short term with the FUD there are opportunities, particularly for those with a long term view.
- If/when electricity demand growth picks up, wind is in pole position.
- Even if demand growth isn't there, good wind projects may be competitive with existing thermal generation.
- Electric vehicles represent an opportunity and allow renewables like wind to provide energy to the transport sector.
- Keep an eye on PV!

Final thought

Reduced contracted thermal fuel volumes are opening the door to increased renewables – lets push against that door!



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