

Wind Integration Workshop



www.windenergy.org.nz



With special thanks to...

- > **Transpower**
- > **Electricity Commission**
- > **MetService**
- > **REpower**
- > **Energy Response**
- > **University of Auckland**

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Today's menu:

- > **Keynote address - Thomas Ackermann**
- > **Status of NZ market & system developments**
Morning tea
- > **Wind energy forecasting**
Lunch
- > **Technical considerations**
Afternoon tea
- > **The role of demand response**



Draft New Zealand
Energy Strategy

Objectives

Electricity System An efficient, renewable electricity system supporting New Zealand's global competitiveness.

and the Draft New Zealand
Energy Efficiency and
Conservation Strategy

July 2010

Targets

90 per cent of electricity will be generated by renewable sources by 2025, providing supply security is maintained.



*“The key challenge with regard to increasing the uptake of renewables is finding ways to integrate intermittent energy sources with electricity grids in a way that ensures security of supply. **New Zealand has growing expertise in the integration of wind energy into our national electricity grid...**”*

Pansy Wong, Associate Energy Minister
APEC Energy Minister's Meeting, June 2010

Unique circumstances?



Wind in NZ today:

497 MW operating (5.5%)

613 MW by mid-2011

1456 GWh (3.5%) in 2009

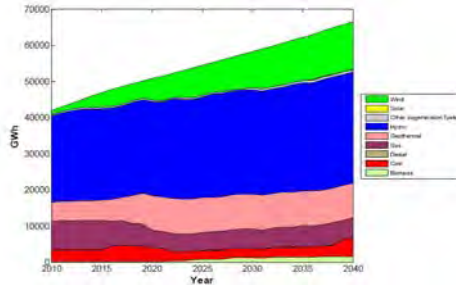


90% renewable, but how much wind?

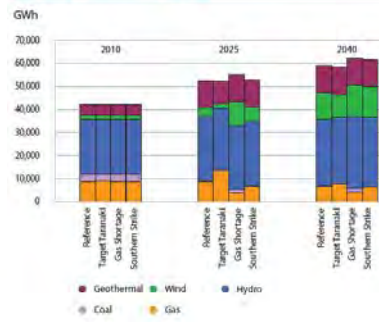


	2010	2020	2030
Energy Demand (TWh)	46	53.5	60.3
Installed wind power capacity (MW)	634	2,066	3,412
Wind power (GWh)	2,285	6,724	10,797
Renewables (%)	75%	75%	75%

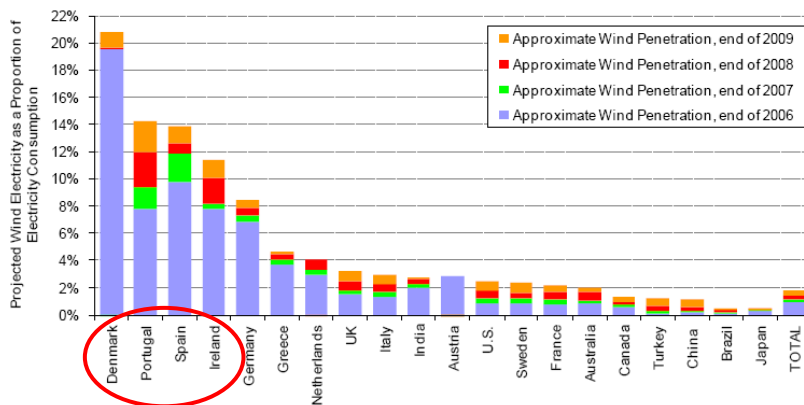
Figure 57 Energy by fuel by year, for the 2010 S1 wind scenario



Electricity Generation by Fuel



Who might we learn from?



Source: Berkeley Lab estimates based on data from BTM Consult and elsewhere

Figure 4. Approximate Wind Energy Penetration in the Twenty Countries with the Greatest Installed Wind Power Capacity

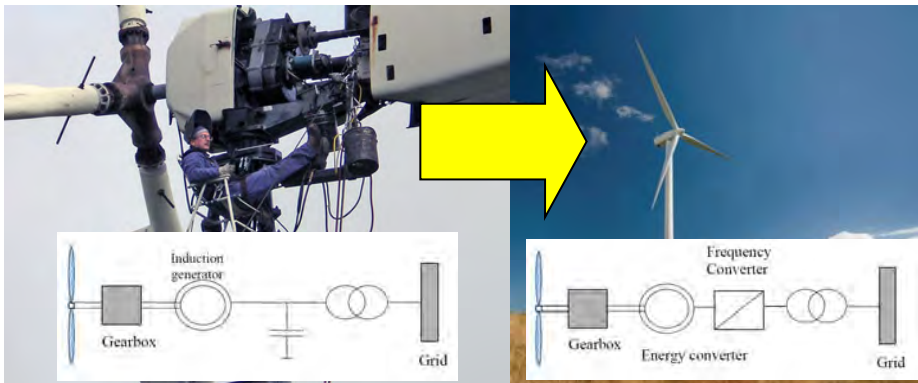
Technology has moved on a bit...



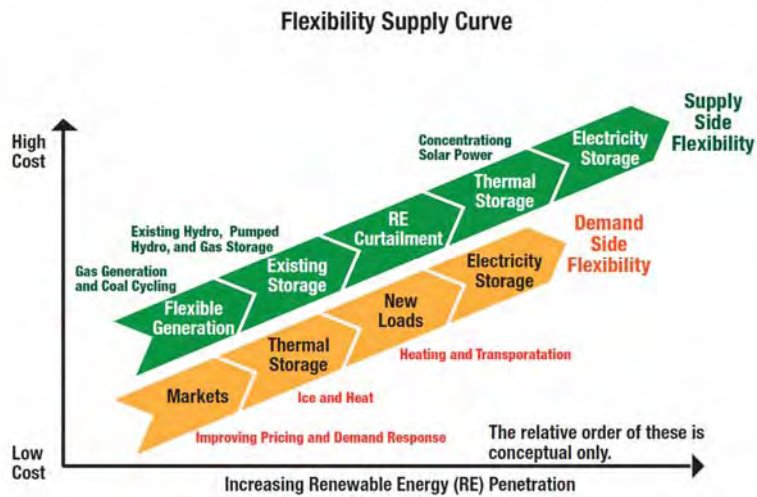
Horse power = 2
(hats optional)

612 horsepower
(hats optional)

Technology has moved on a bit...



What are our options?



Source: NREL

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Topic for today



What should our priorities be for incorporating increasing quantities of wind generation into the:

- a) Power system?
- b) Electricity market?

(And where do these priorities sit relative to other system and market issues?)

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