

New Zealand: Electricity and gas markets

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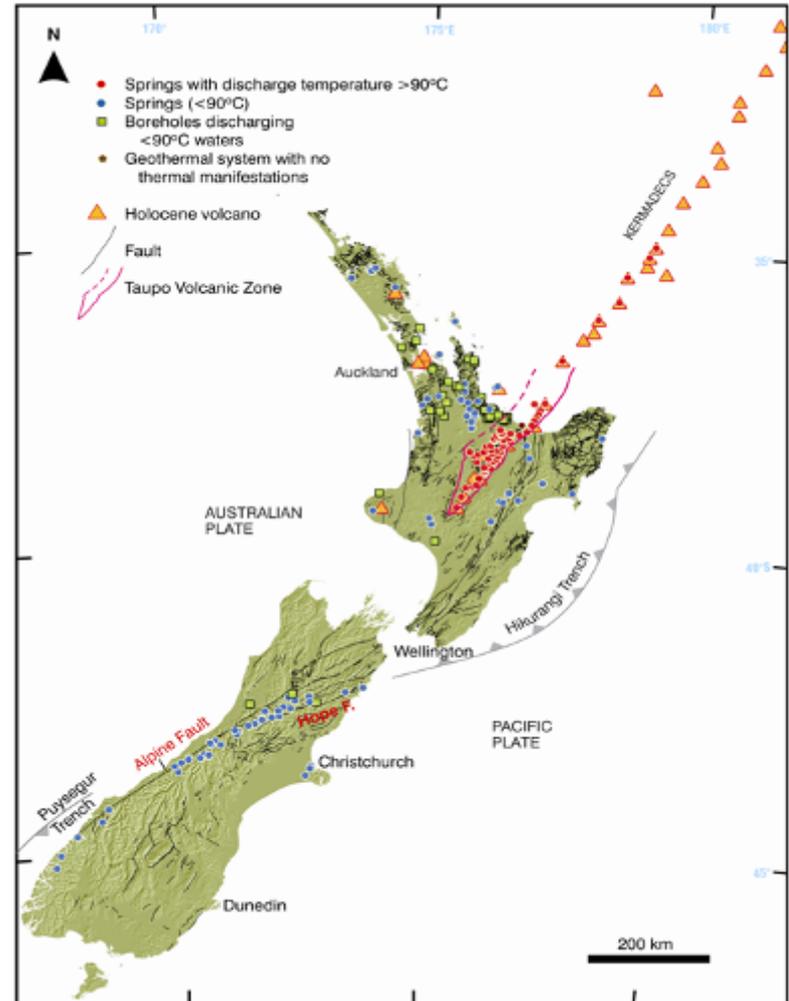
New Zealand's place in the world



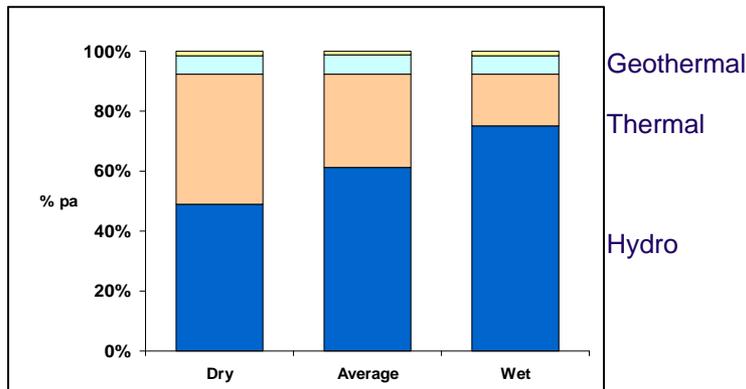
- Small population
 - 4.4 million
- Two islands a long way from anywhere
 - Cannot import electricity
- In the 'Roaring Forties'
 - Provides world class wind resource

Geologically challenging....

- Between the Pacific Plate and the Australian Plate
- On the 'Pacific Ring of Fire'
 - provides world class geothermal resource
 - About 12 percent of total generation and growing

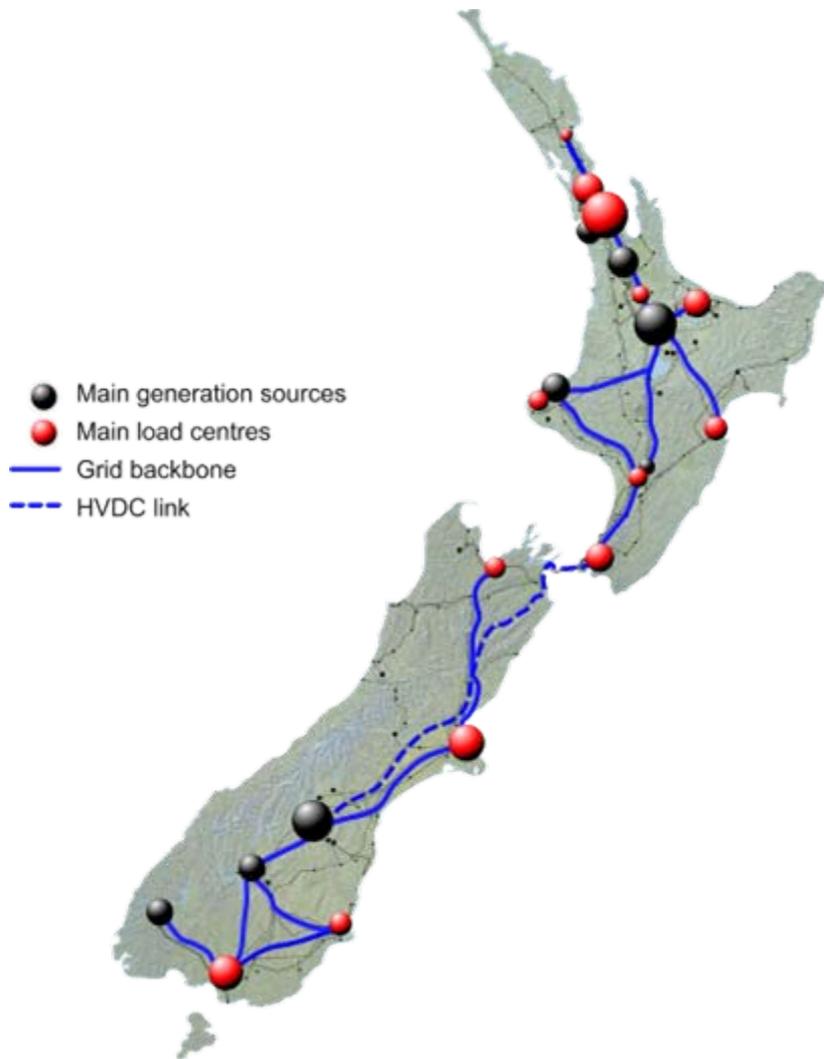


Plenty of water, usually...



- Very good hydro resource
- Usually around 60 percent of total generation
- But
 - Small storage capacity (10% of annual demand)
 - Big difference between wet and dry years
 - Inverse correlation between main inflows (spring/summer) and main demand (winter)
 - Most of storage in South Island, most demand in North Island
- Makes system volatile and hard to manage. Substantial thermal backup required
- Dry years in 2001, 2003, 2006 and 2008
- Public conservation campaigns required 2001 and 2003

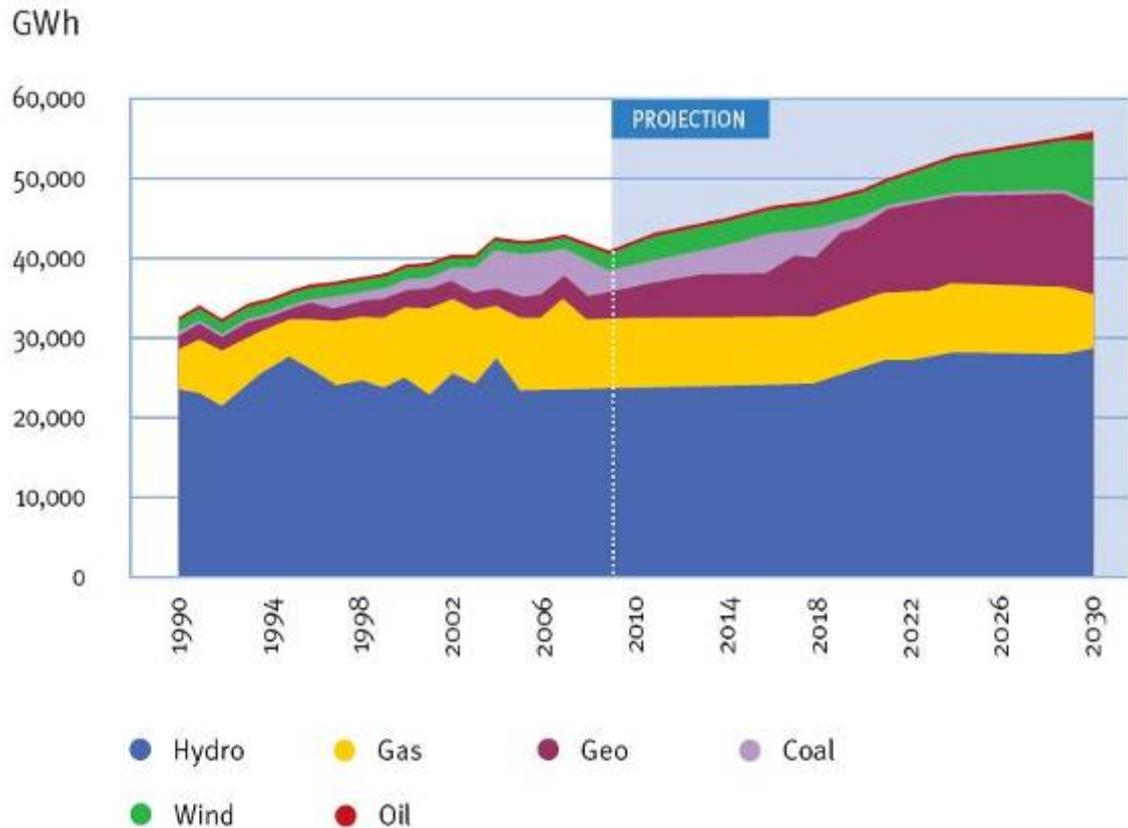
New Zealand's power system



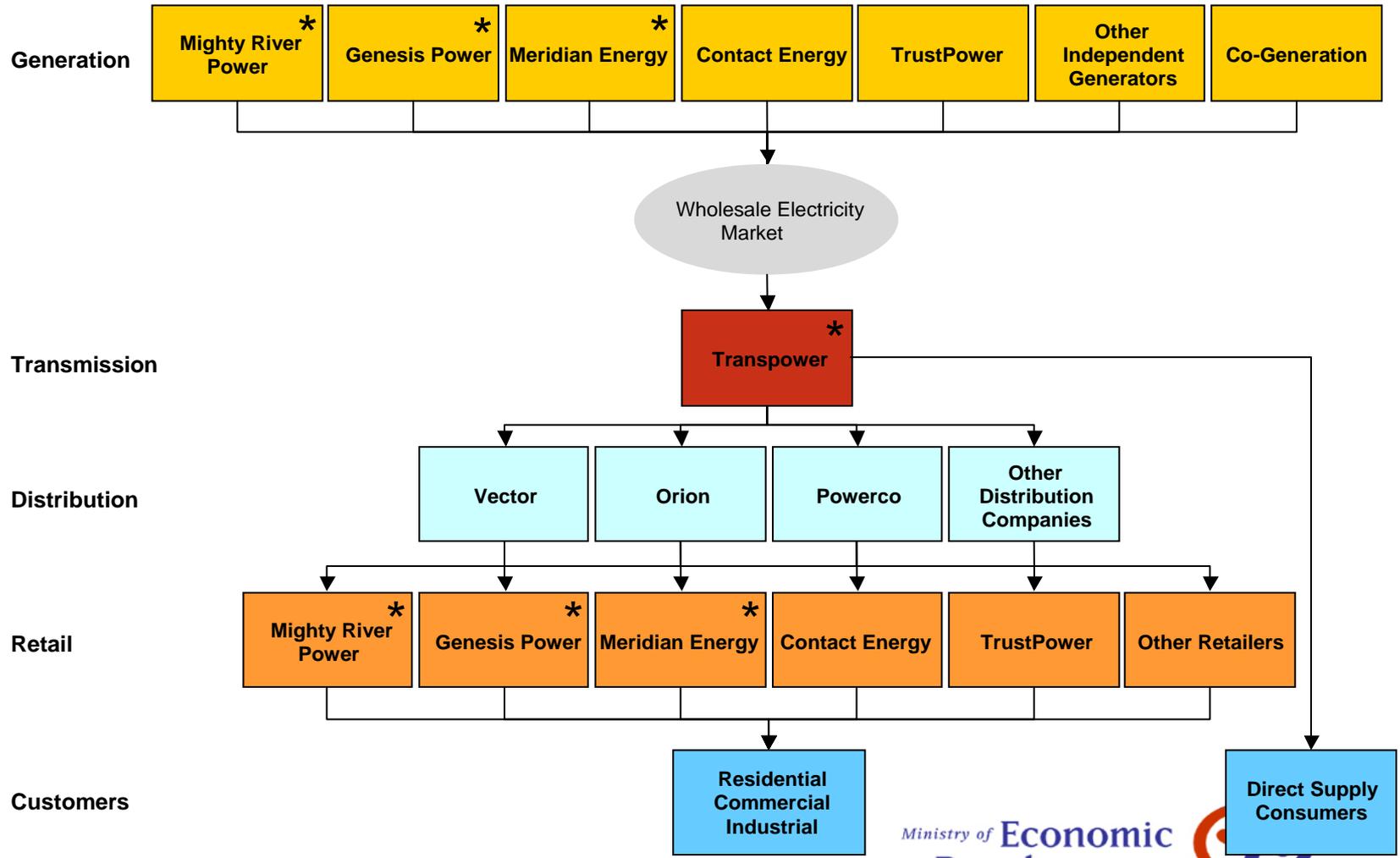
- Installed generation 9500 MW
- Peak demand (in winter) 6750 MW
- Total energy supply 42,000 GWh/yr
- Two AC island power systems
- Connected by 700MW HVDC link
- Power mainly transferred north, but south in dry years

Electricity generation to 2030

- Demand growth forecast ~1.5% pa
- Coal-fired generation gone by 2020: becomes too expensive with carbon charge
- Geothermal and wind
 - most economic new generation
 - expected to replace coal
 - renewables grow to 86% (from 72%) by 2030
- New generation build
 - open entry / no licences or approvals except environmental
 - no subsidies or special tariffs for renewables



Structure of NZ electricity industry



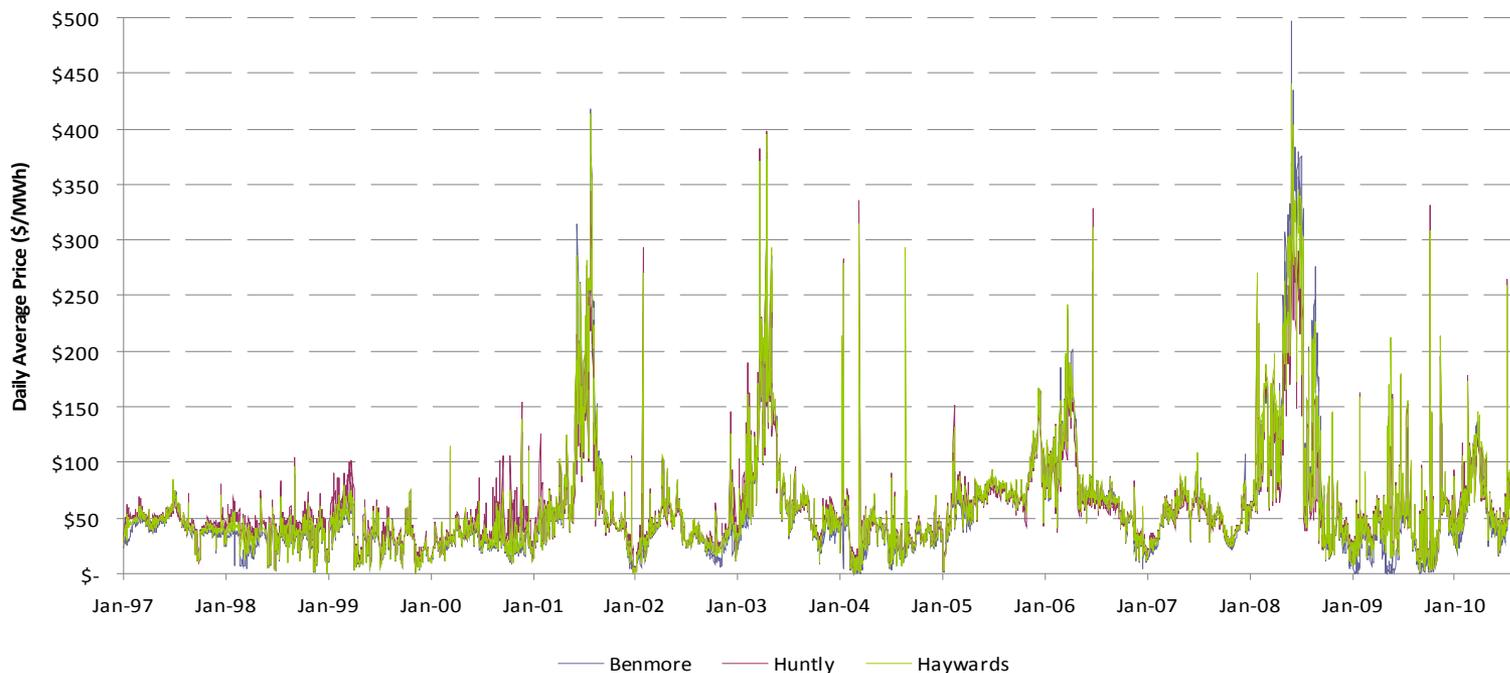
Electricity market

- 5 main generators
 - 3 state-owned enterprises (SOEs)
 - 2 privately owned
- 1 system operator / grid owner-operator (SOE: Transpower)
- 29 local lines companies
- 11+ electricity retailers
- Most generators and retailers are vertically integrated
- Some separation rules apply between lines businesses and generation / retail businesses
 - Separation rules are a mix of ownership, corporate and behavioural

Wholesale market

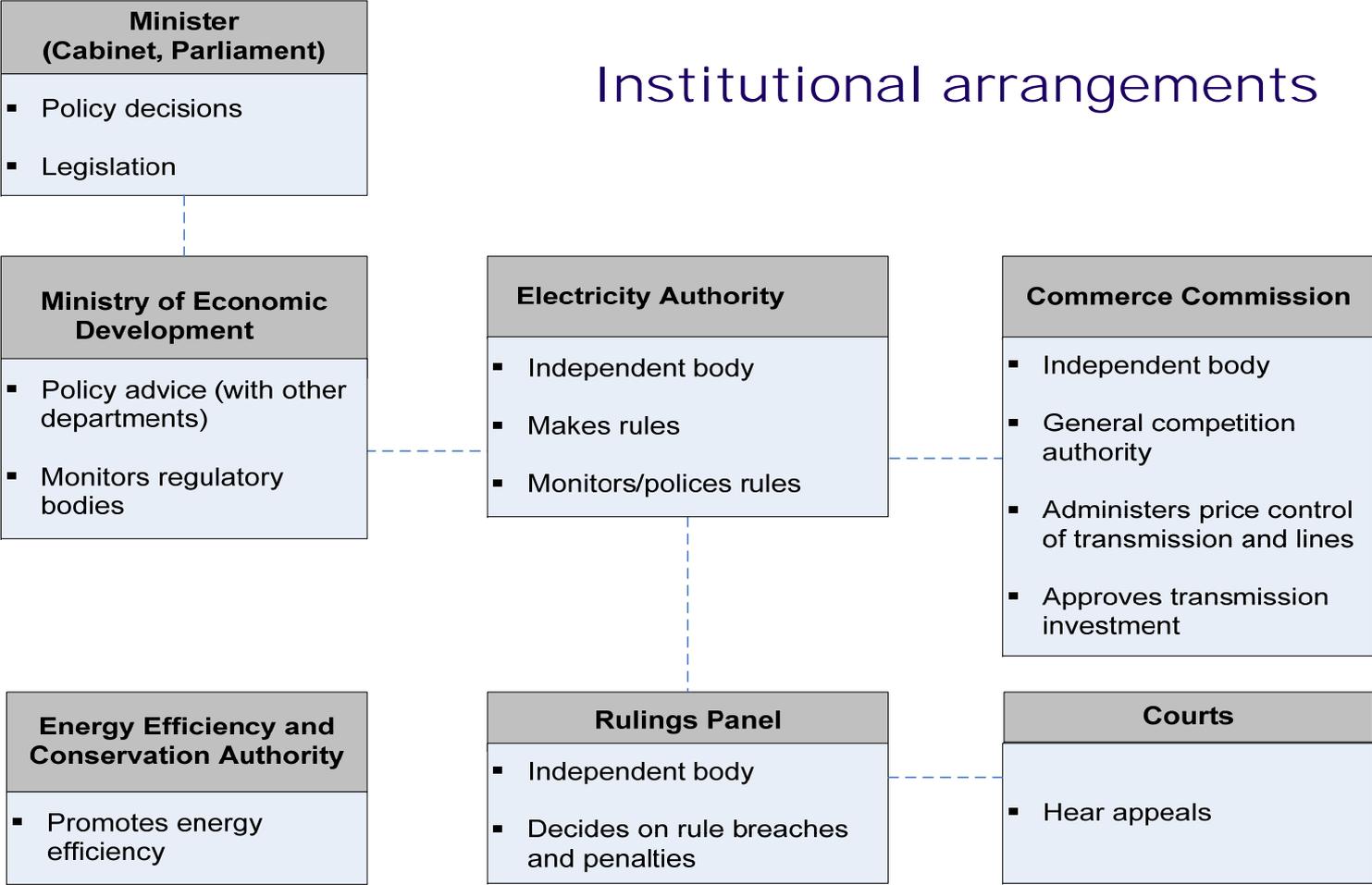
- Mandatory wholesale spot market: all grid-connected power must be offered into and bought from the half-hourly spot market
- All generators receive price of most expensive generation required to be dispatched
- Energy-only market (no capacity market or capacity payments)
- Nodal prices: ~250 injection and offtake nodes (prices reflect transmission losses and constraints)
- System operator dispatches generation in real time and operates the grid
- Wholesale buyers may enter into financial hedges to reduce or avoid exposure to spot prices
 - Vertically integrated generator-retailers have an internal ‘natural’ hedge
 - Liquid hedge / futures market being developed (with mandatory participation by major generator-retailers)
- Rules set by market regulator (Electricity Authority)

Spot prices are volatile....



- Daily average spot prices since the start of the wholesale market
- Note sustained high spot prices in 2001, 2003, 2006 and 2008 dry years

Institutional arrangements



Outcomes

Successful

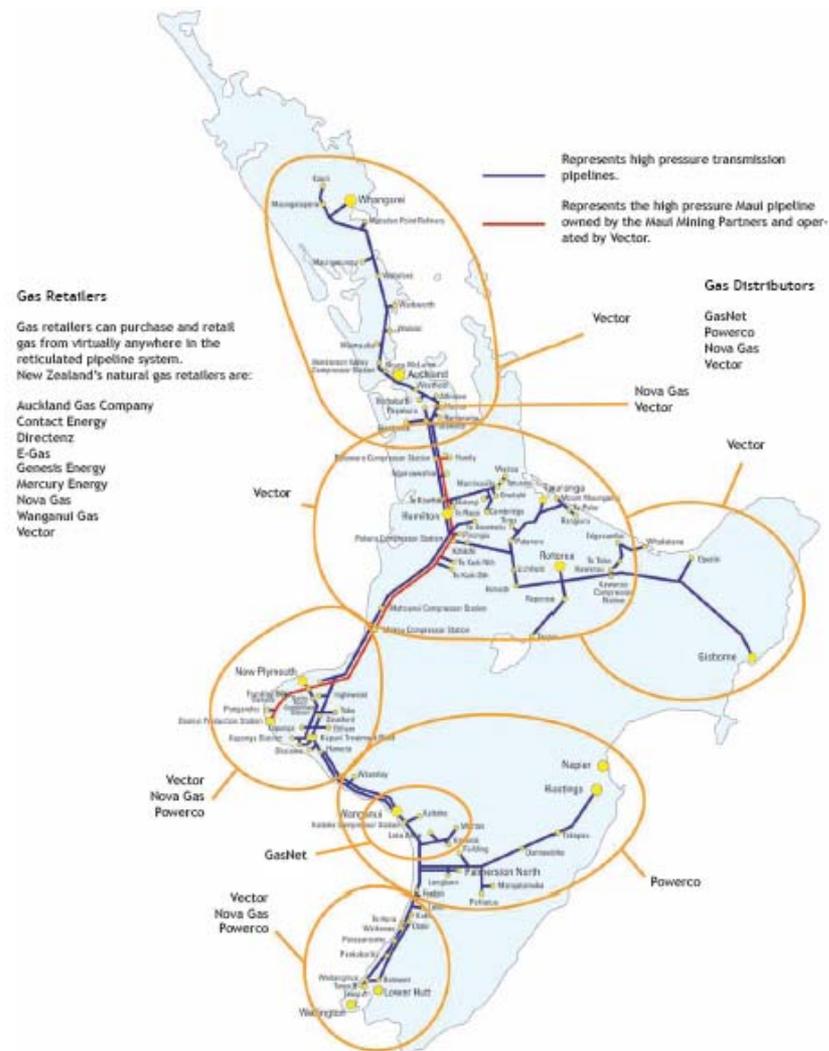
- Sufficient new generation being built: supply margins maintained
- On-going pressure for efficiency
- Good diversity of generation build: least cost options built to time and budget
- Efficient prices
 - Cross-subsidies eroded away
 - Prices reflect (rising) cost of building new capacity

Not so successful

- Retail margins have increased, especially for residential consumers
 - Not enough retail competition, especially outside main centres and in South Island
- Poor management of security of supply in dry years
 - Incentives on generator-retailers and major users to rely on and lobby for conservation campaigns
- *Recent reforms address these issues*
 - SOE asset swaps
 - Liquid hedge market
 - Transmission hedges
 - Lines allowed to undertake retailing
 - Conservation campaigns will cost generator-retailers and major users
 - Re-vamped regulator

Gas market

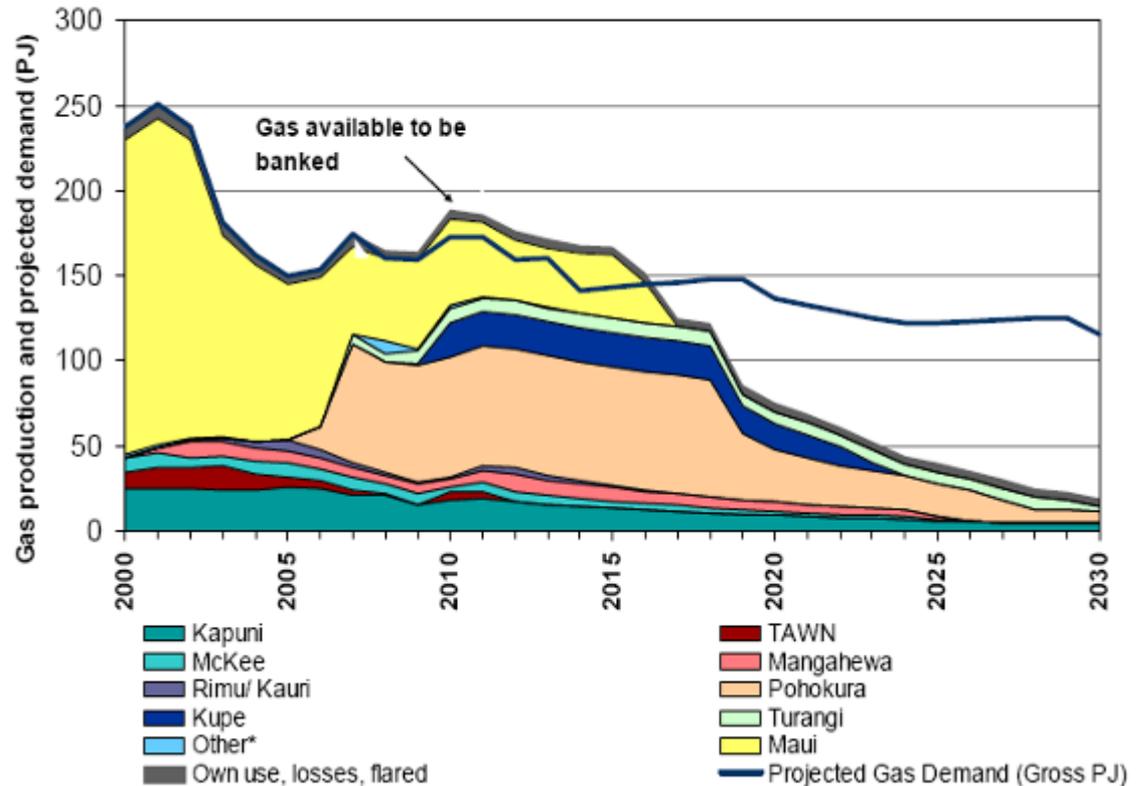
- Only reticulated in the North Island
 - LPG in South Island
- Fully competitive but relatively concentrated market
- Fully privately-owned
- Main transmission and distribution pipeline owner is vertically integrated into wholesaling and retailing
- Main uses
 - Electricity generation
 - Petrochemicals (swing user)
 - Commercial and residential: small

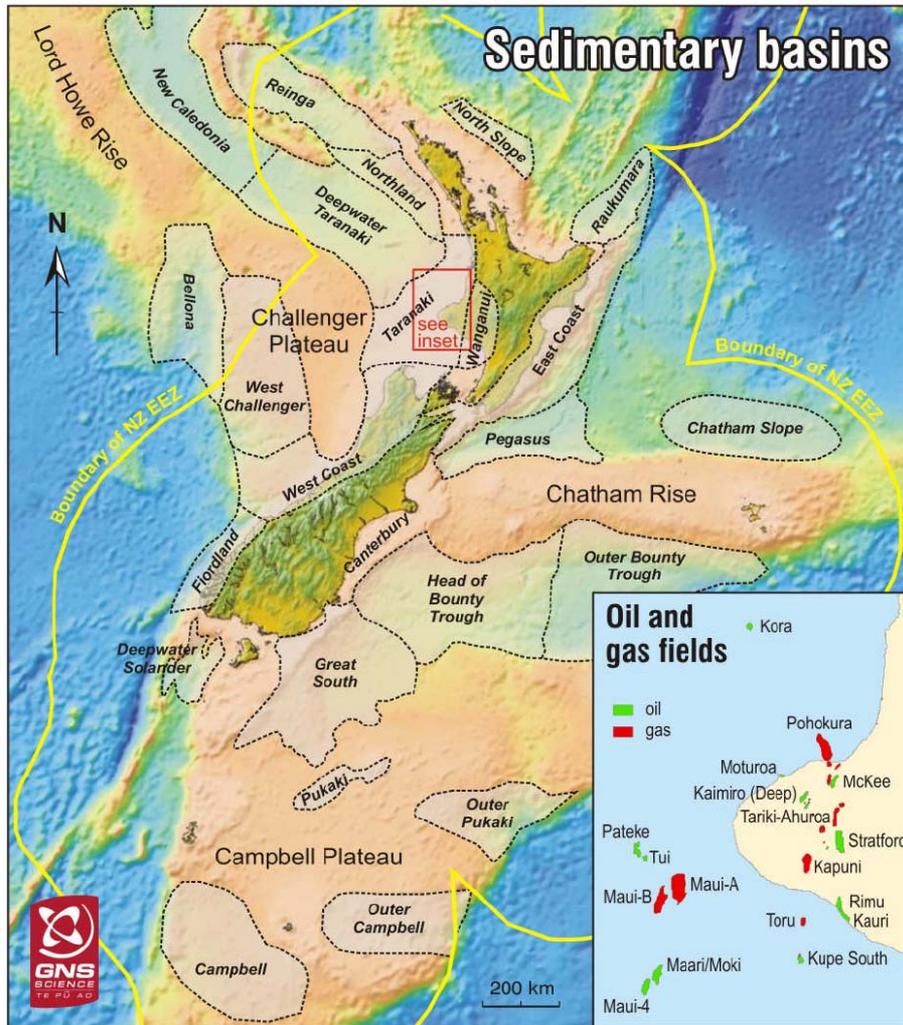


Gas supply

- Gas market historically (25 years) dominated by large Maui field
- Being replaced by a number of smaller fields
- Much more complex to manage (standards, balancing, access to processing facilities and pipelines etc)

New Zealand Gas Production and Known Reserves





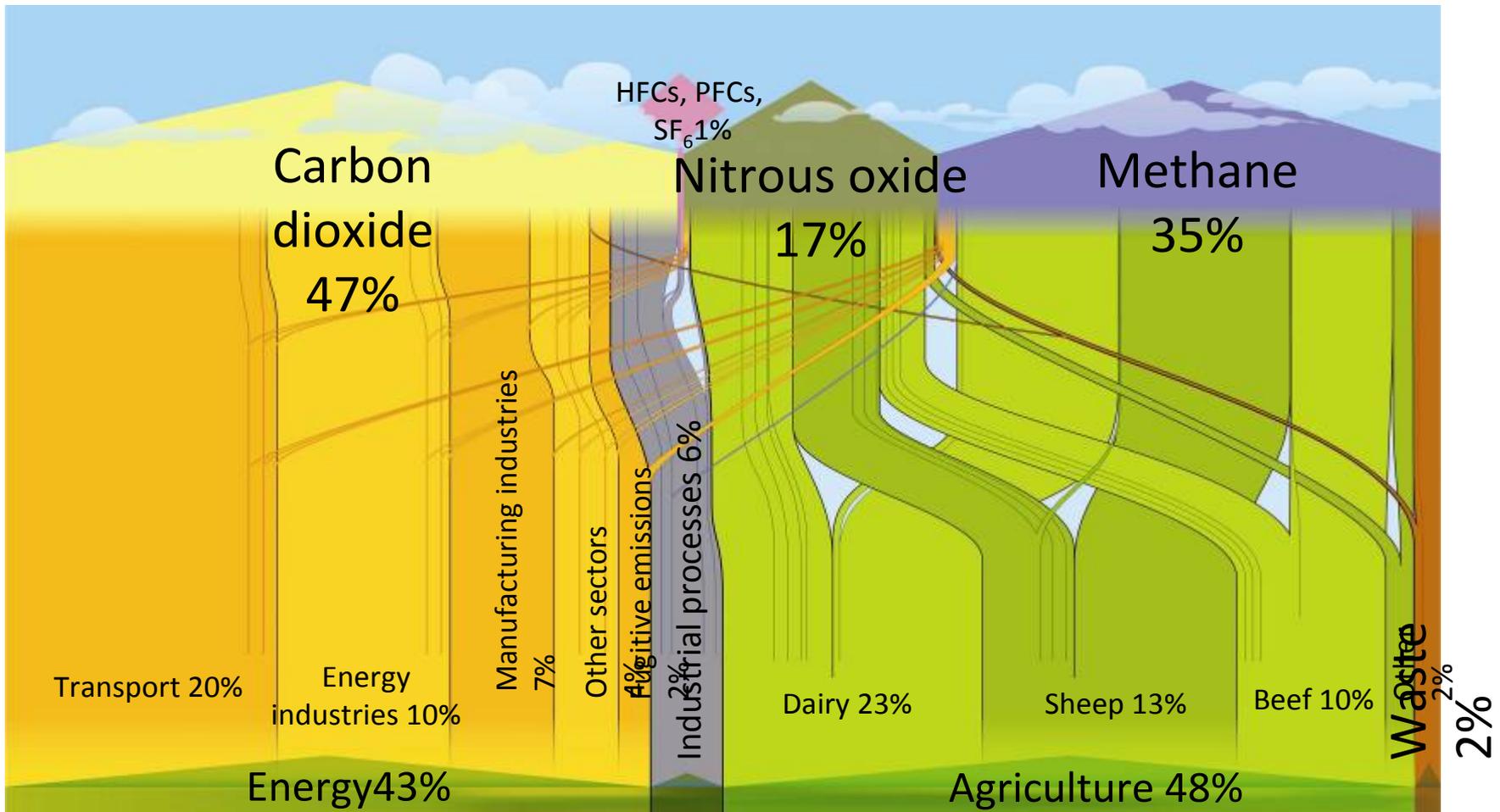
Plenty of potential.....

- Current oil and gas producing fields are located only in the Taranaki basin (on-shore and off-shore)
- Other basins appear attractive
- 'Petroleum Action Programme' to promote interest in exploration

Gas market: institutional arrangements

- Same as for electricity
 - with a notable exception:
- Gas regulator is a private company: Gas Industry Co (GIC)
 - Jointly owned by all industry stakeholders (including demand-side)
 - Set up under legislation (6 years ago)
 - Majority of Board and chair are ‘independent’ persons (elected by shareholders of GIC)
 - Recommends regulations and rules to the Minister
 - Minister may only accept/reject/send back recommendations
 - GIC must deliver on government policy as set out in a Government Policy Statement
- Reason for this set-up: ensure full industry involvement in rule-making
- GIC has had successes, though has found it challenging to resolve entrenched industry disputes

Climate change policy: New Zealand's emissions



Putting a price on emissions

- Full cap-and-trade emissions scheme introduced 2008
- Covers all sectors including agriculture
- Assistance for emissions-intensive trade-exposed industry
- No assistance for electricity and fuel companies
- Timetable for sectors to enter the scheme

Sector	Voluntary reporting	Mandatory reporting	Full obligations
Forestry	-	-	1 January 2008
Transport fuels	-	1 January 2010	1 July 2010
Electricity production	-	1 January 2010	1 July 2010
Industrial processes	-	1 January 2010	1 July 2010
Synthetic gases	1 January 2011	1 January 2012	1 January 2013
Waste	1 January 2011	1 January 2012	1 January 2013
Agriculture	1 January 2011	1 January 2012	1 January 2015

Any questions?

