



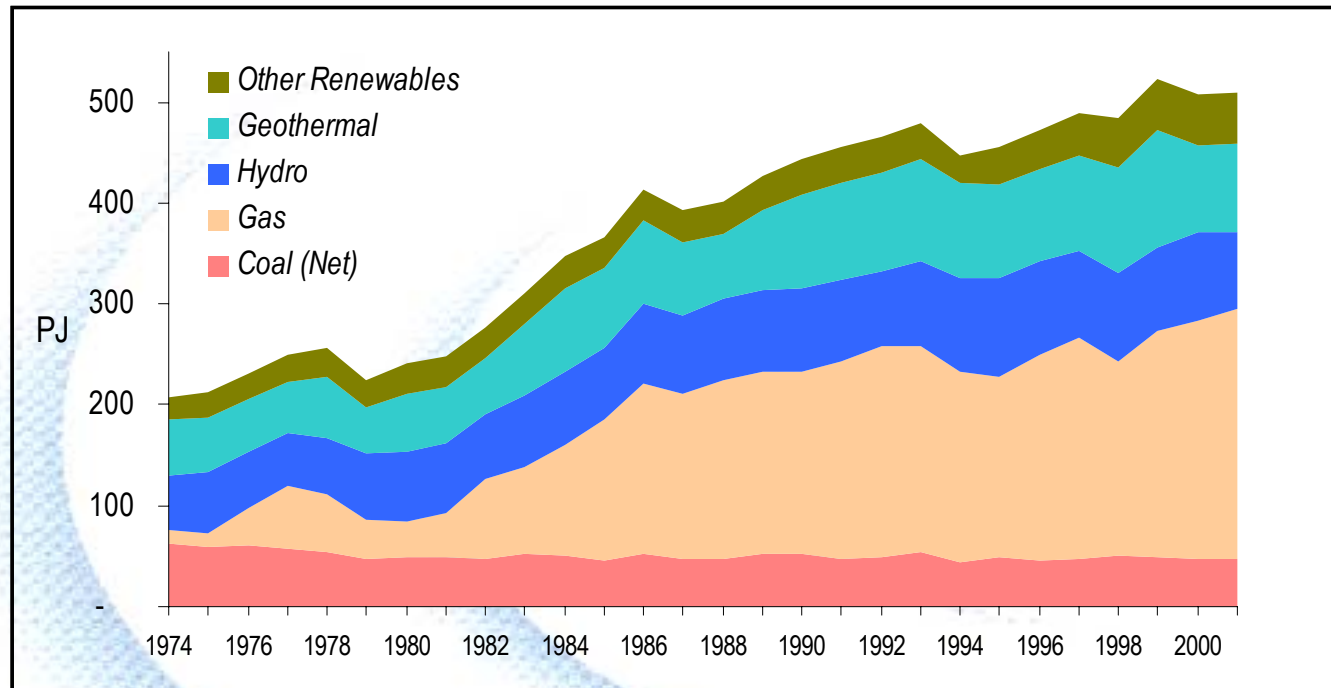
The Challenge of Meeting NZ's Energy Supply Needs As Maui Declines

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Concept Consulting Group

Concept Consulting Group

- range of energy sector clients in NZ
- strong focus on energy market development, strategy, and market analysis
- developed analytical approach and modelling tools to assist analysis
- emphasis on electricity sector

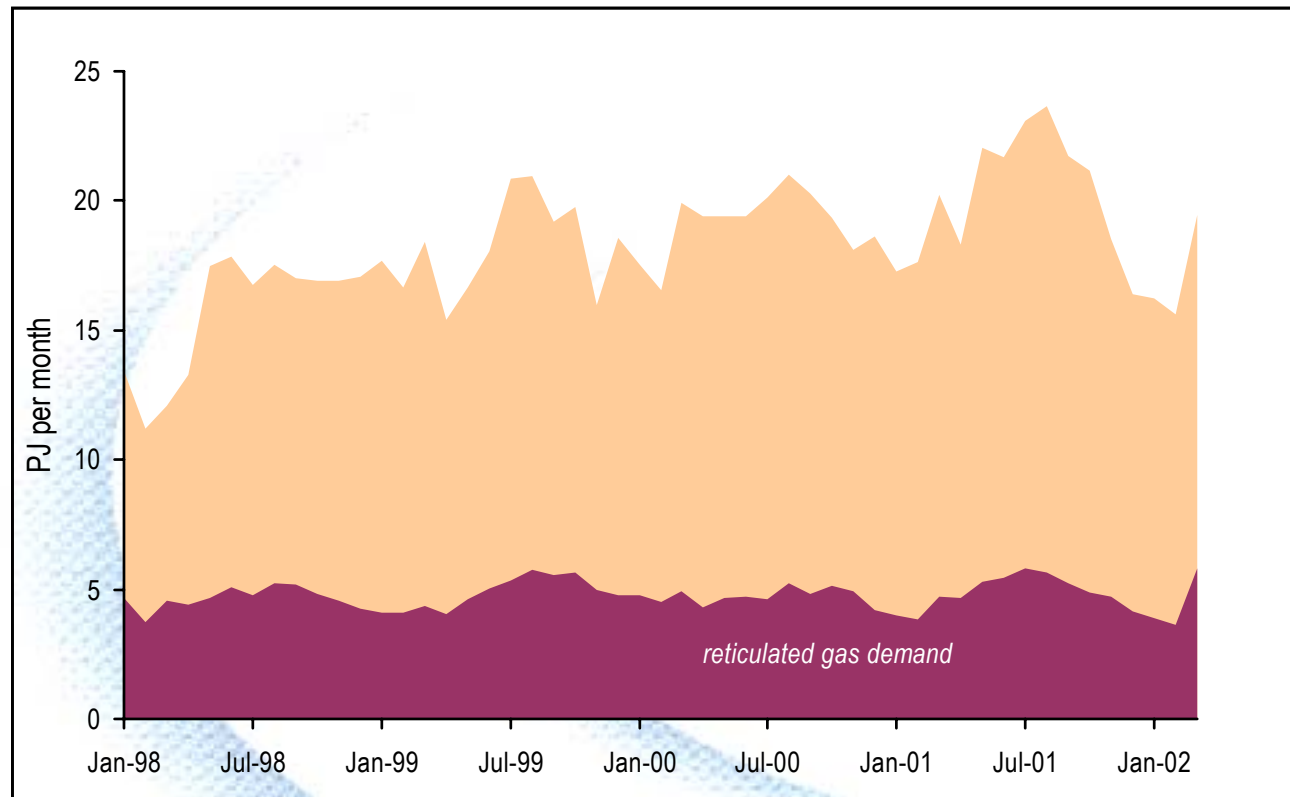
Historical Maui Contribution *To non transport energy supply*



Natural gas has become an extremely important part of NZ's energy supply with the advent of the Maui field

Historical Maui Flexibility

Gas demand



Maui gas has provided the flexibility to accommodate hydro variability in NZ's electricity supply system

Things Are Changing.....

Because:

- Maui field is now in decline
- Flexibility of production is also declining
- Redetermination will reallocate residual entitlements amongst the gas contract parties

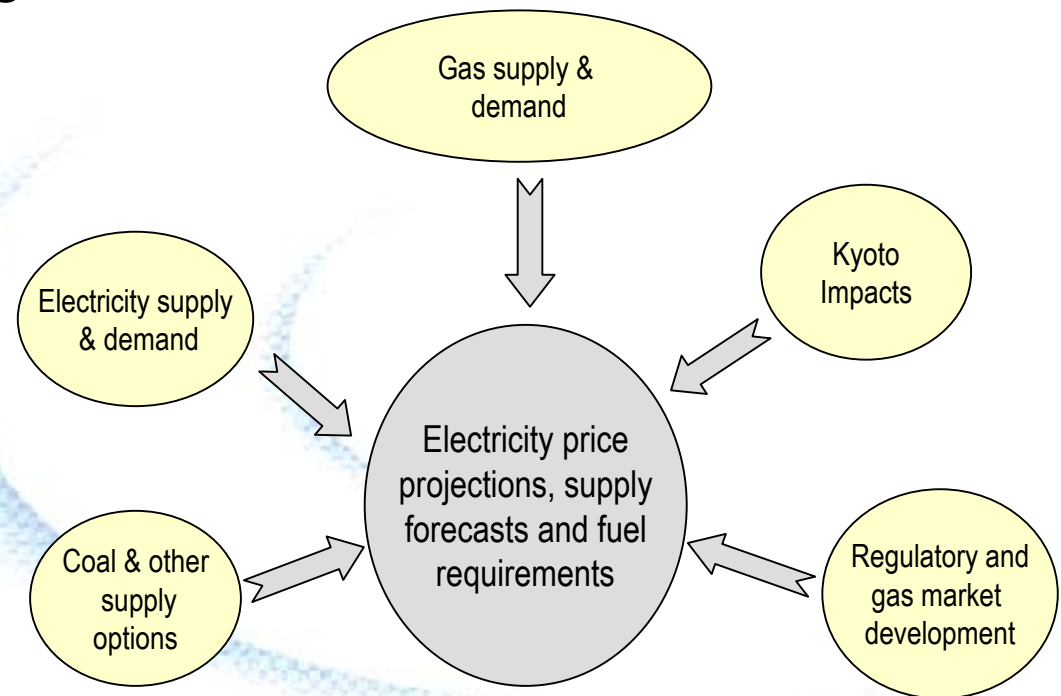
NZ faces two key questions:

- How to replace Maui gas contribution to energy supply needs?
- How to replace Maui gas flexibility?

Modelling Framework

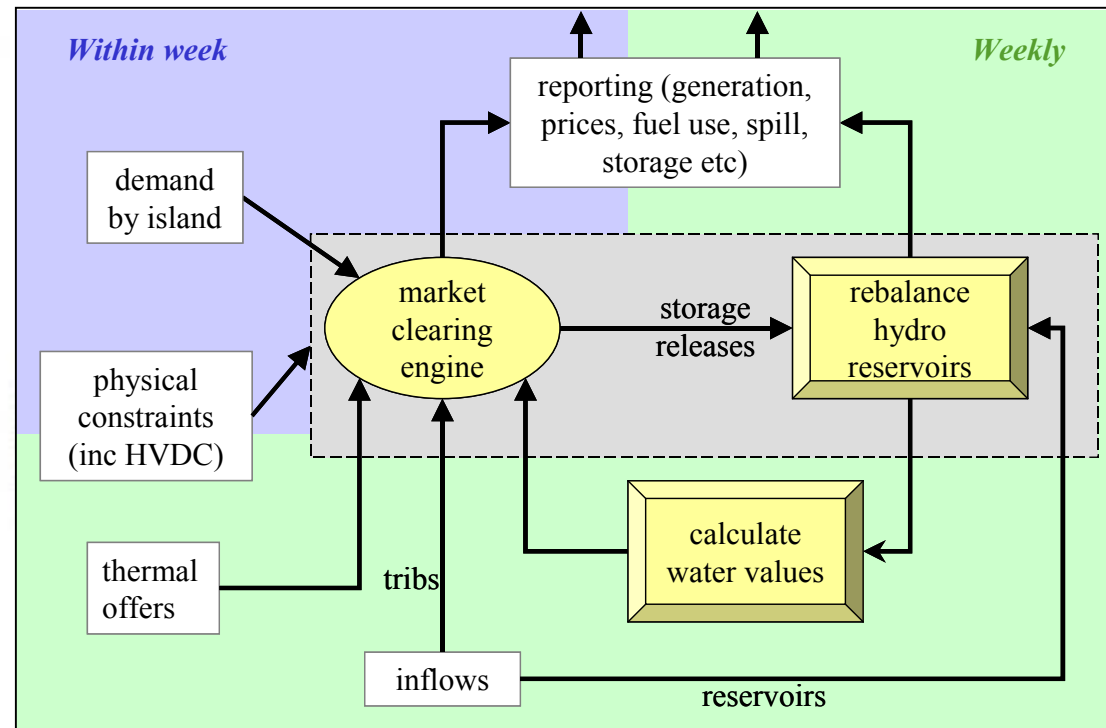
Key areas of analysis

- regulatory environment
- gas supply and demand
- short & long run electricity production costs
- demand projections
- energy market dynamics



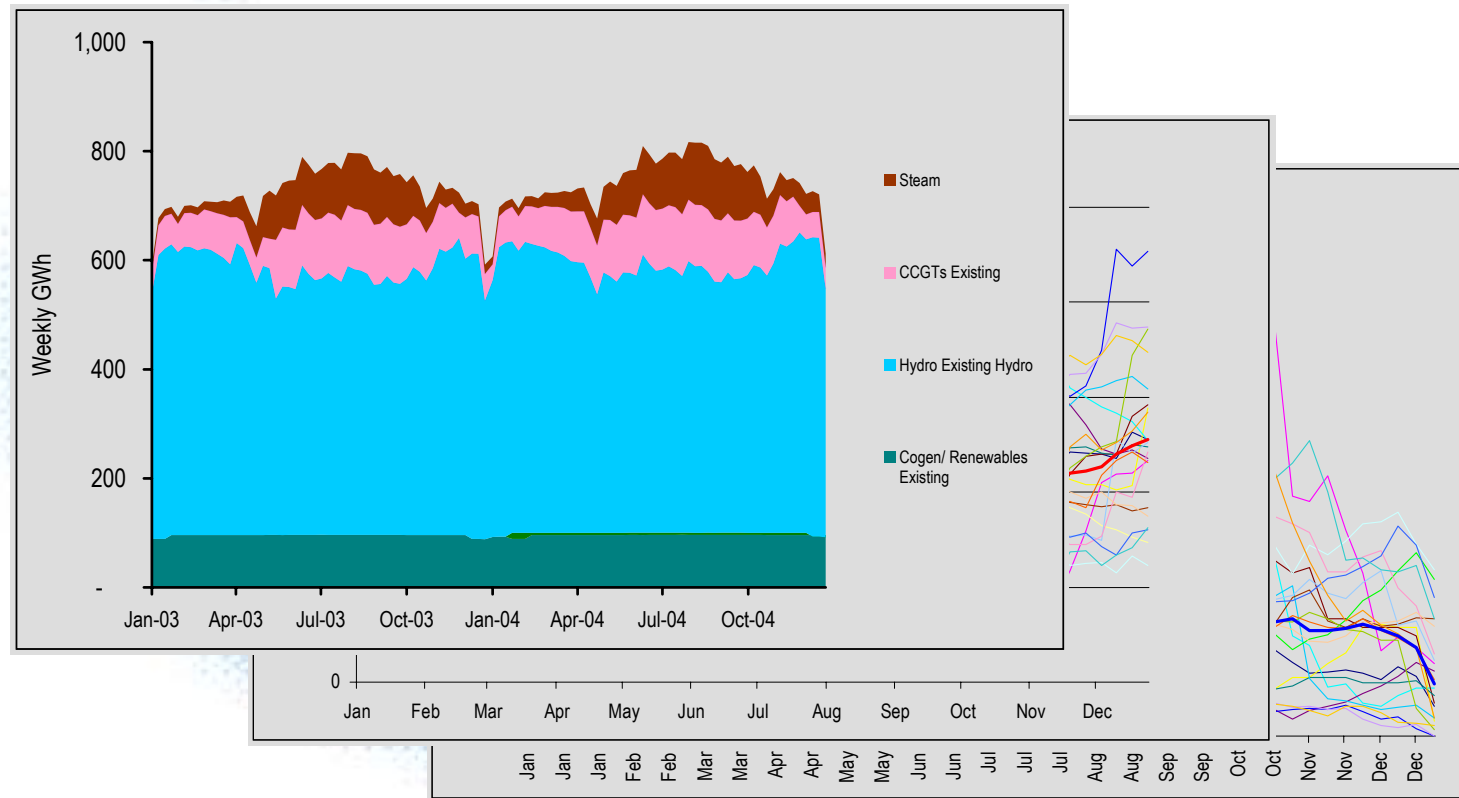
EMOS

- timeframe months to years
- multiple inflow scenarios
- weekly hydro storage simulation
- market clears in multiple blocks per week



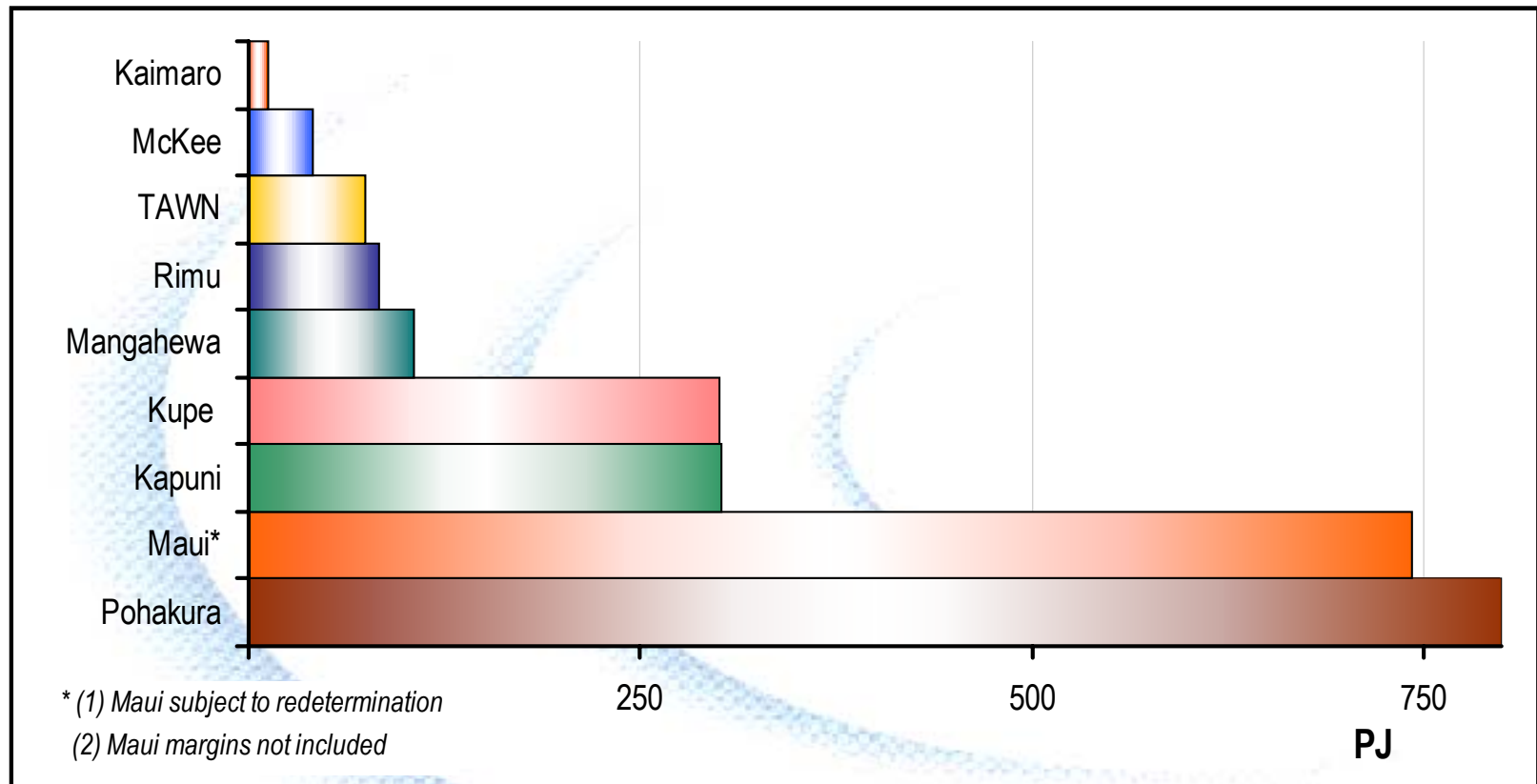
Typical Outputs

- projections of price, hydro storage, production, HVDC, fuel by week & block within week

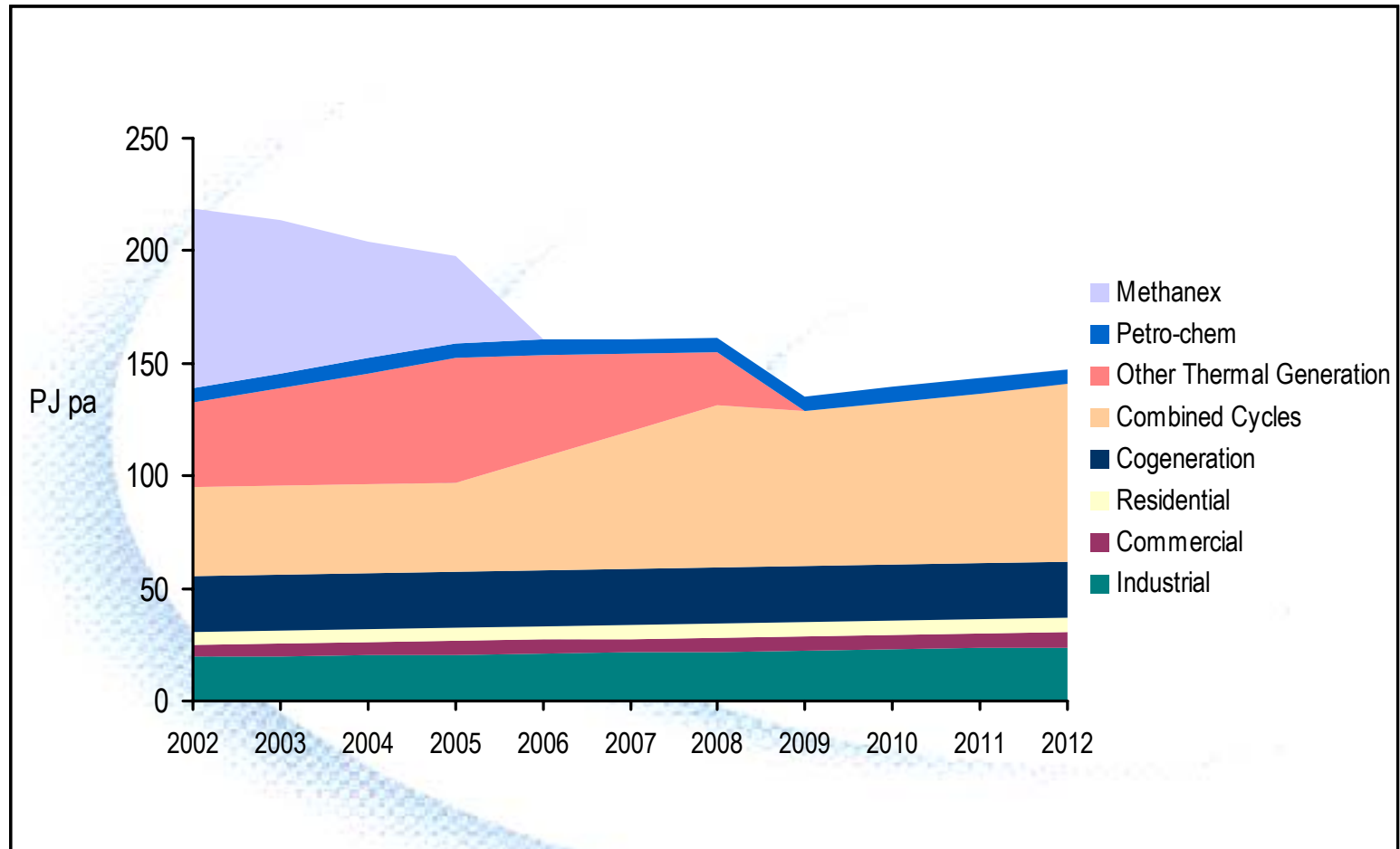


Estimated Gas Reserves

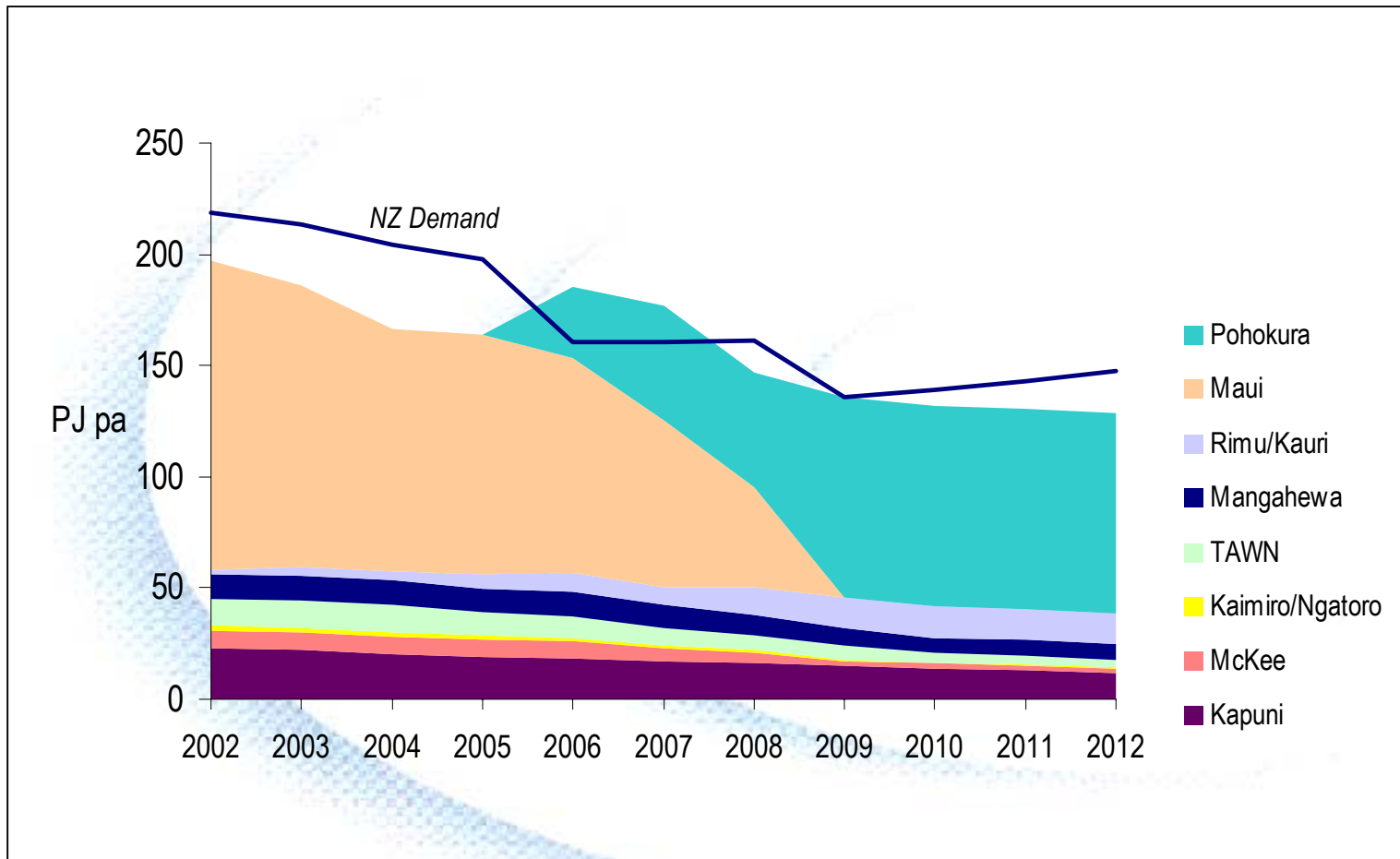
January 2002 (July 2002 EDF)



Gas Demand



Gas Supply



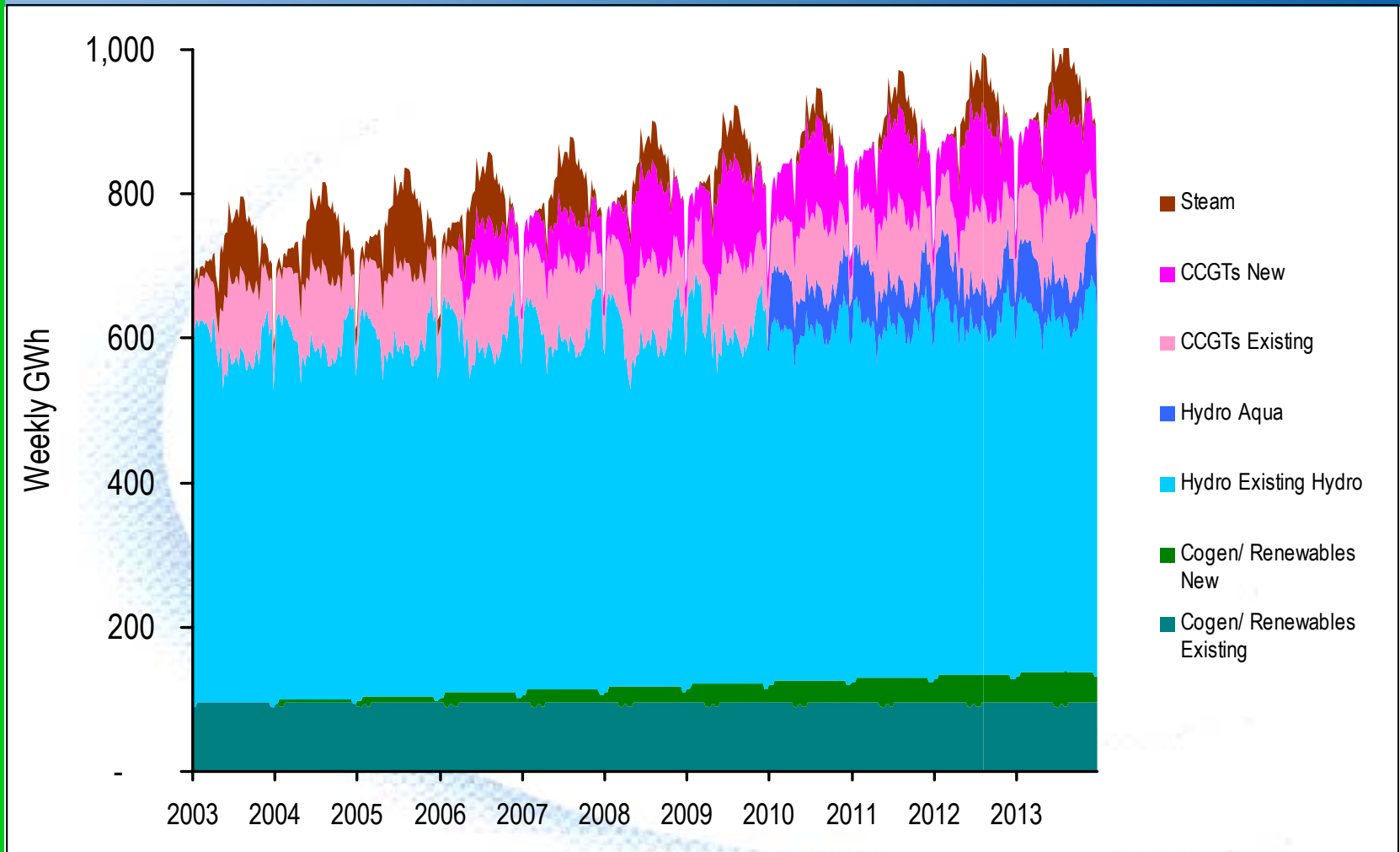
Implications for Gas Supply Availability

- gas supply will become more constrained
- supply will go to premium use

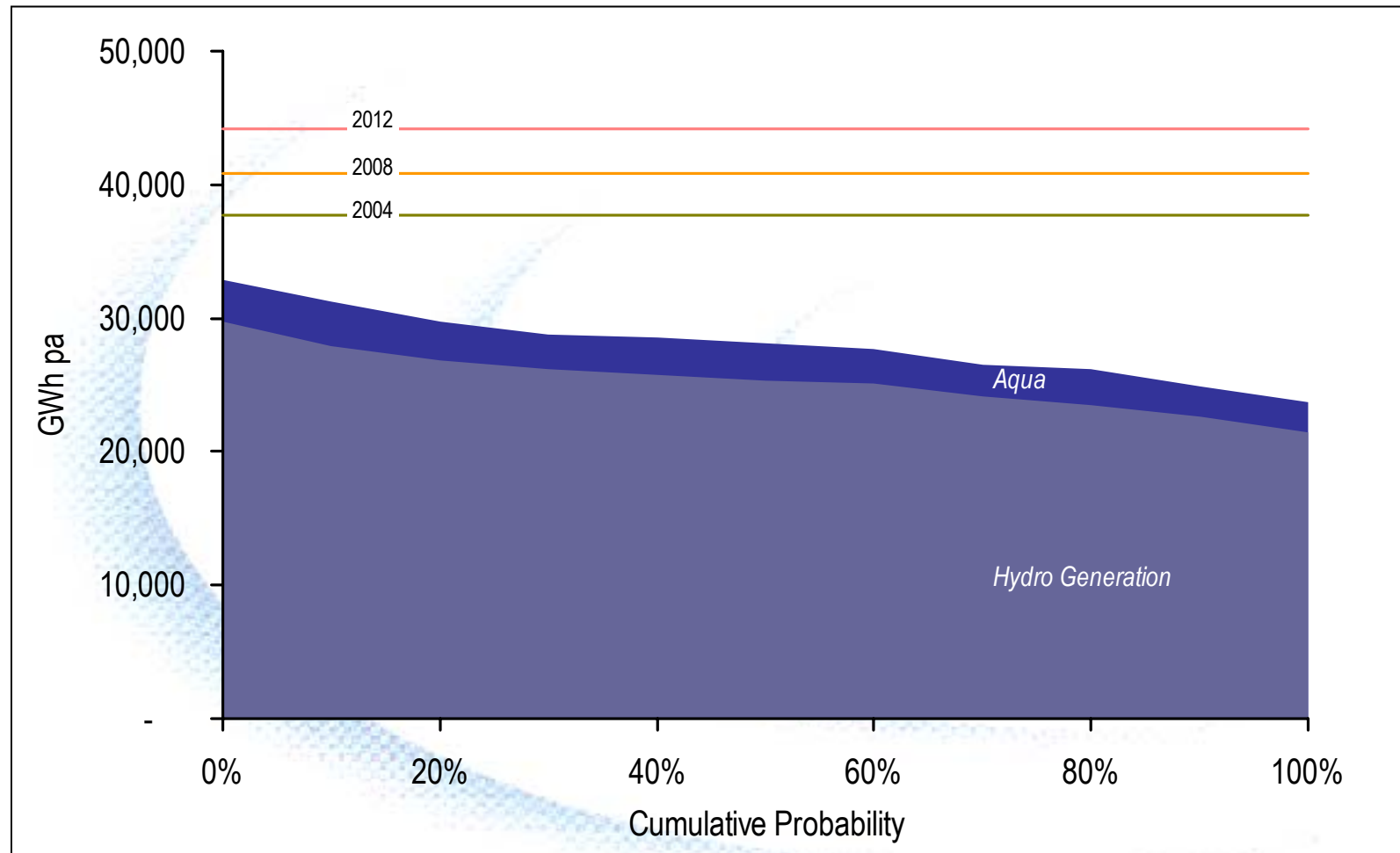
Industrial
Commercial
Residential
Cogeneration
Combined Cycle
Other thermal
Methanol

Premium Uses

Electricity Sector - Meeting Demand

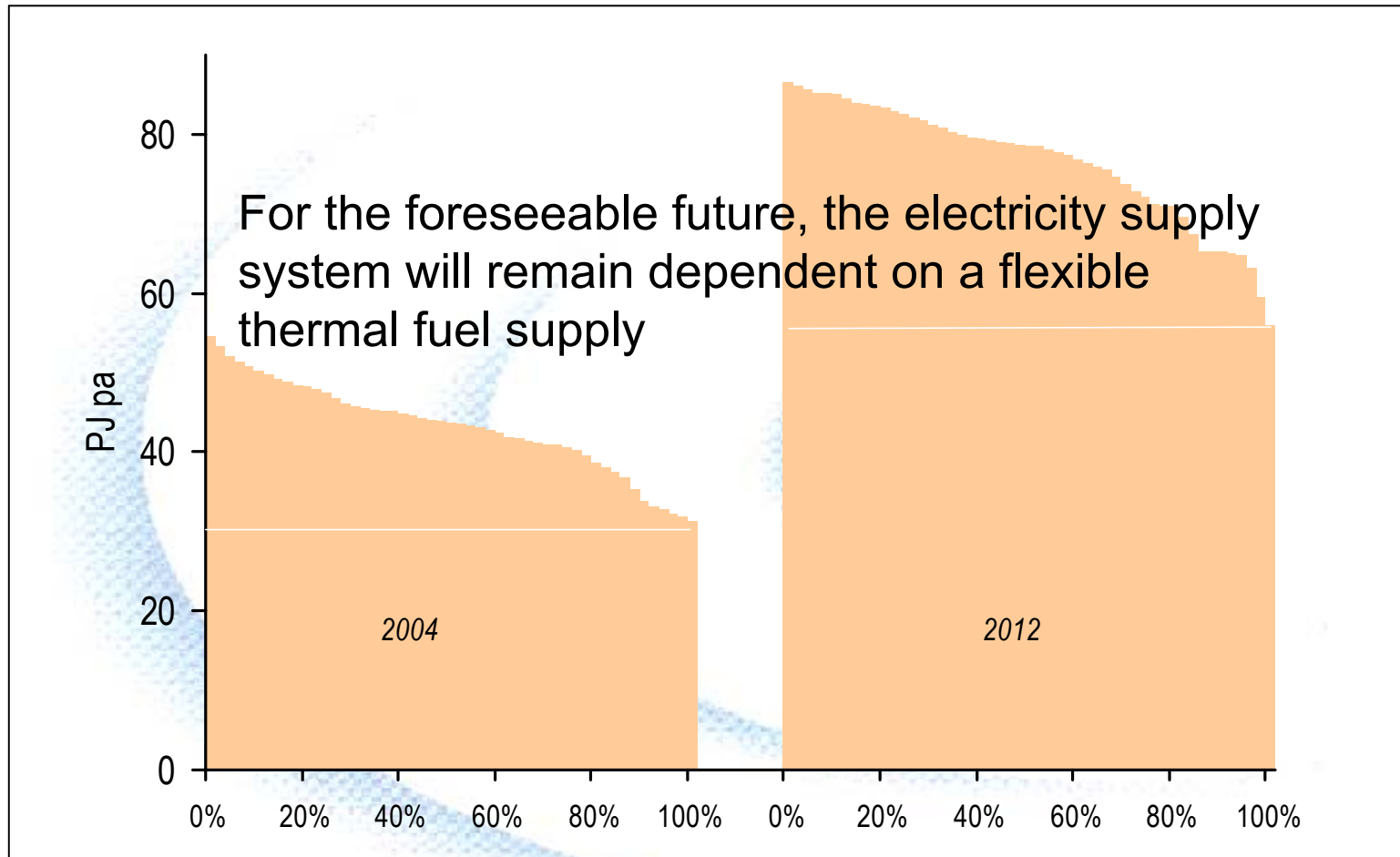


Replacing Maui Flexibility



Thermal Flexibility Required

Net Thermal Electricity Demand



Thermal Generation Requirements

Net Thermal Demand	2004	2012
Wet Year	31PJ	56PJ
Dry Year Flexibility	+24PJ	+31PJ

Where can this flexibility come from?

- future gas supplies may have limited flexibility
- renewable and distributed technologies tend to be inflexible for technical or economic reasons
- flexible coal supplies to Huntly power station may offer the best prospect

Kyoto Context

- renewable technologies will become more attractive under a Kyoto scenario
- but economic options are limited and tend to rely on flexible back up supply
- meeting NZ's energy security requirements with flexible coal supply options poses a challenge in the context of NZ's Kyoto commitments
- however, in the medium term, it is hard to envisage any other fuel providing the necessary flexibility