

ENERGY OUTLOOK

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Topics

- IEA's World Energy Outlook 2002
- New Zealand Energy Outlook

IEA's World Energy Outlook: Key Findings

- world energy demand will grow by 66% in next 30 years
- fossil fuels will continue to dominate
- security of supply for international trade in oil and gas is a major issue
- security of supply in electricity markets is also a major issue
- renewables will grow faster than any other energy source, but will still make only a small dent in global energy demand in 2030
- worldwide CO₂ emissions are projected to grow to 80% above current levels by 2030

Chart 1: World Primary Energy Demand

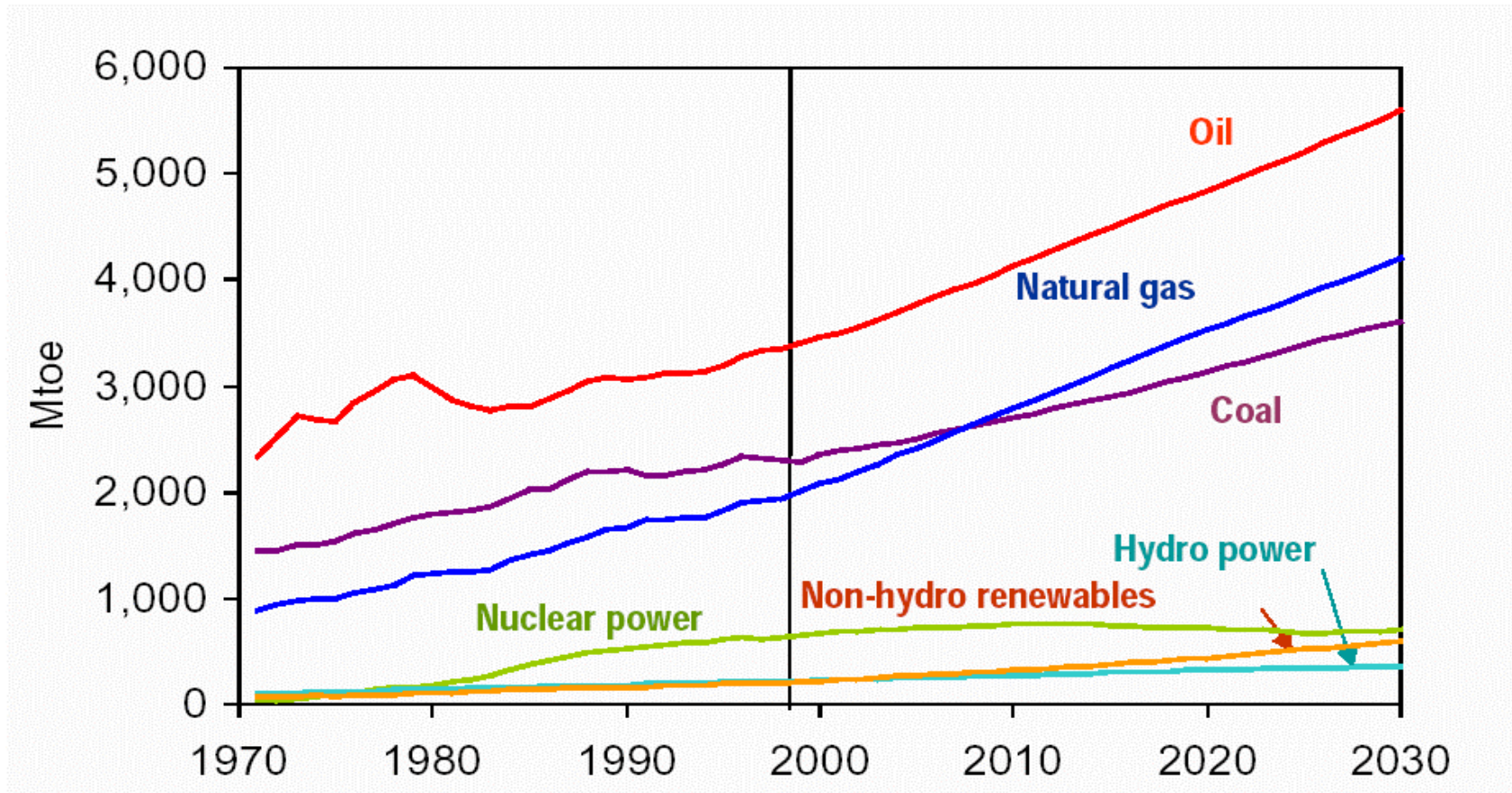
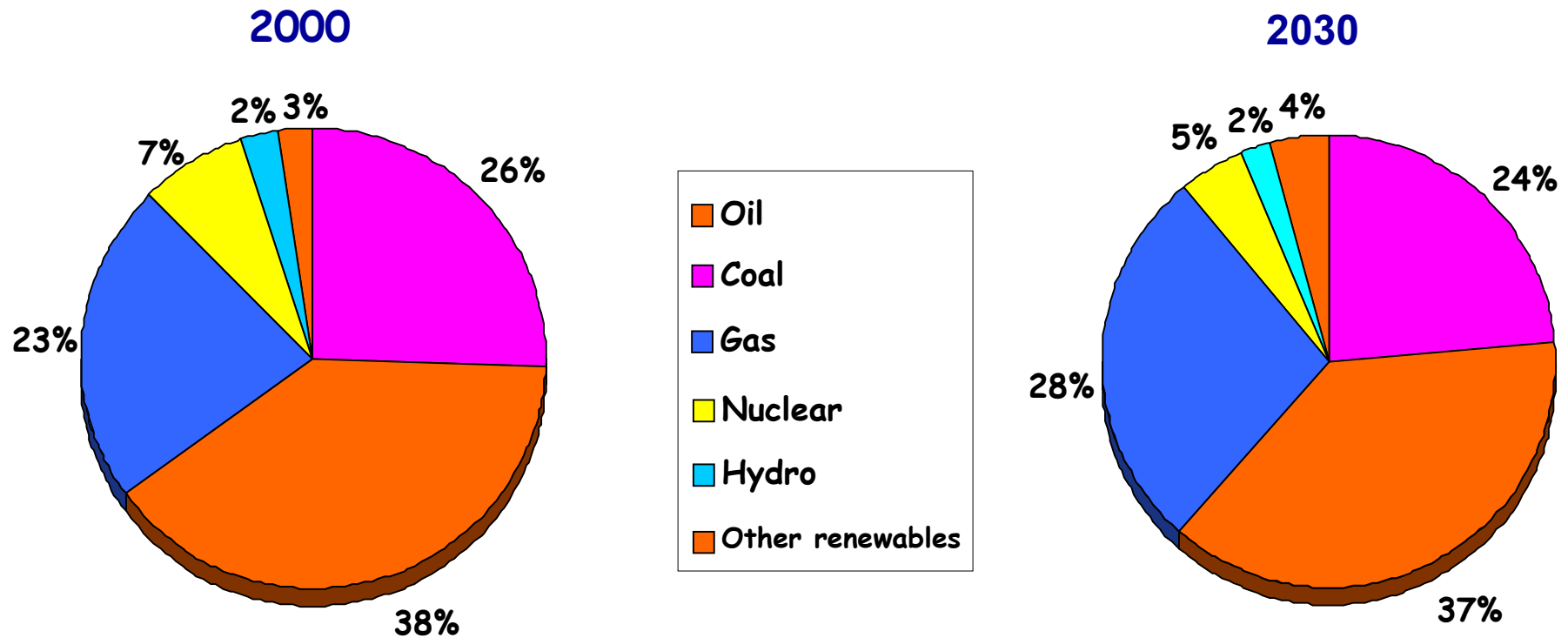


Chart 2: Breakdown of Primary Energy Demand



Security of Supply

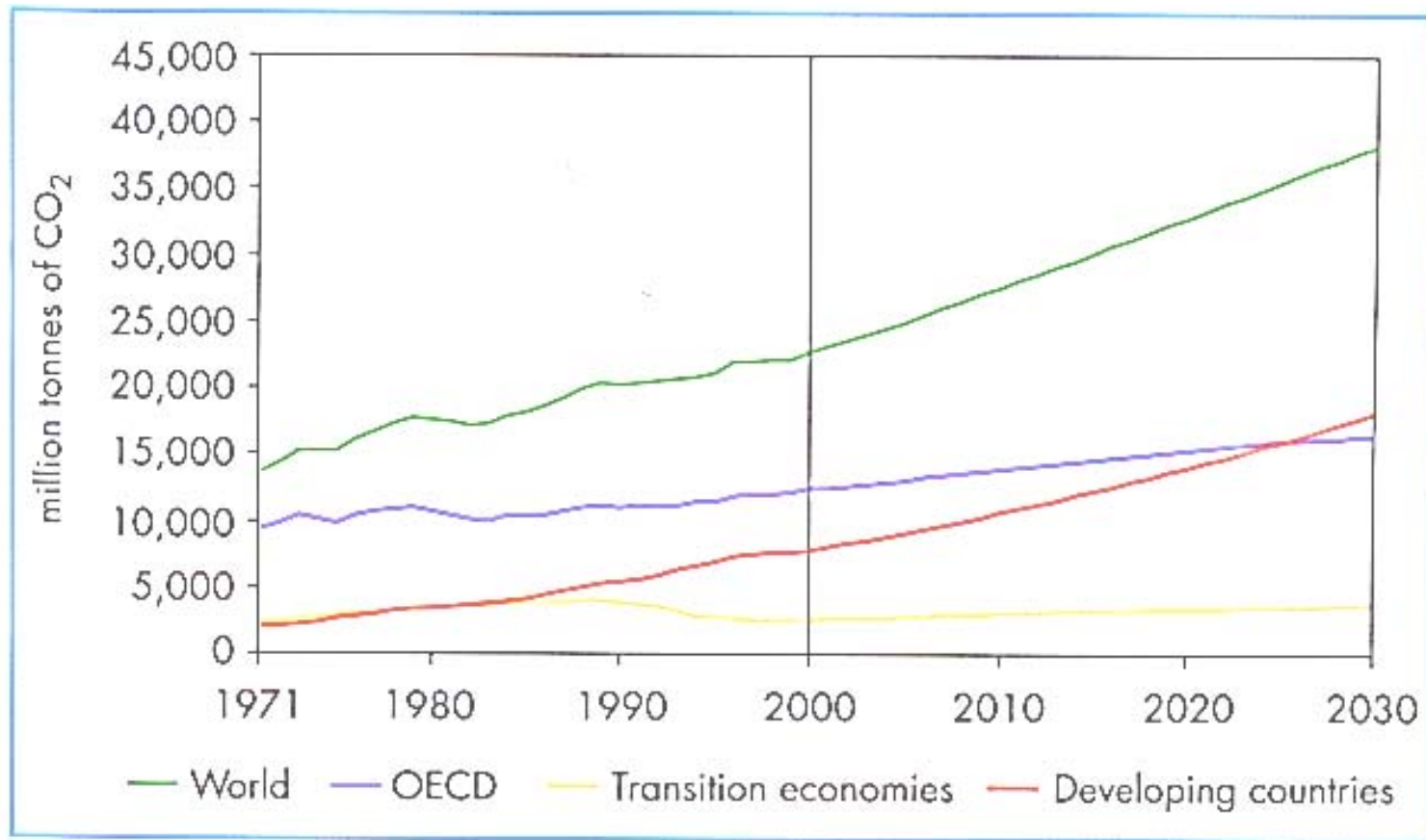
Oil and Gas

- imports by major consuming countries will grow substantially
- production will be increasingly concentrated in the Middle East and the former Soviet Union
- concerns about disruptions to international energy markets will intensify
- there will be increased emphasis on diversifying fuels, and sources of fuels

Electricity

- investment of about US\$4.2 trillion needed in new capacity
- most of the investment is needed in developing countries

Chart 3: Energy Related CO₂ Emissions



New Zealand Energy Outlook

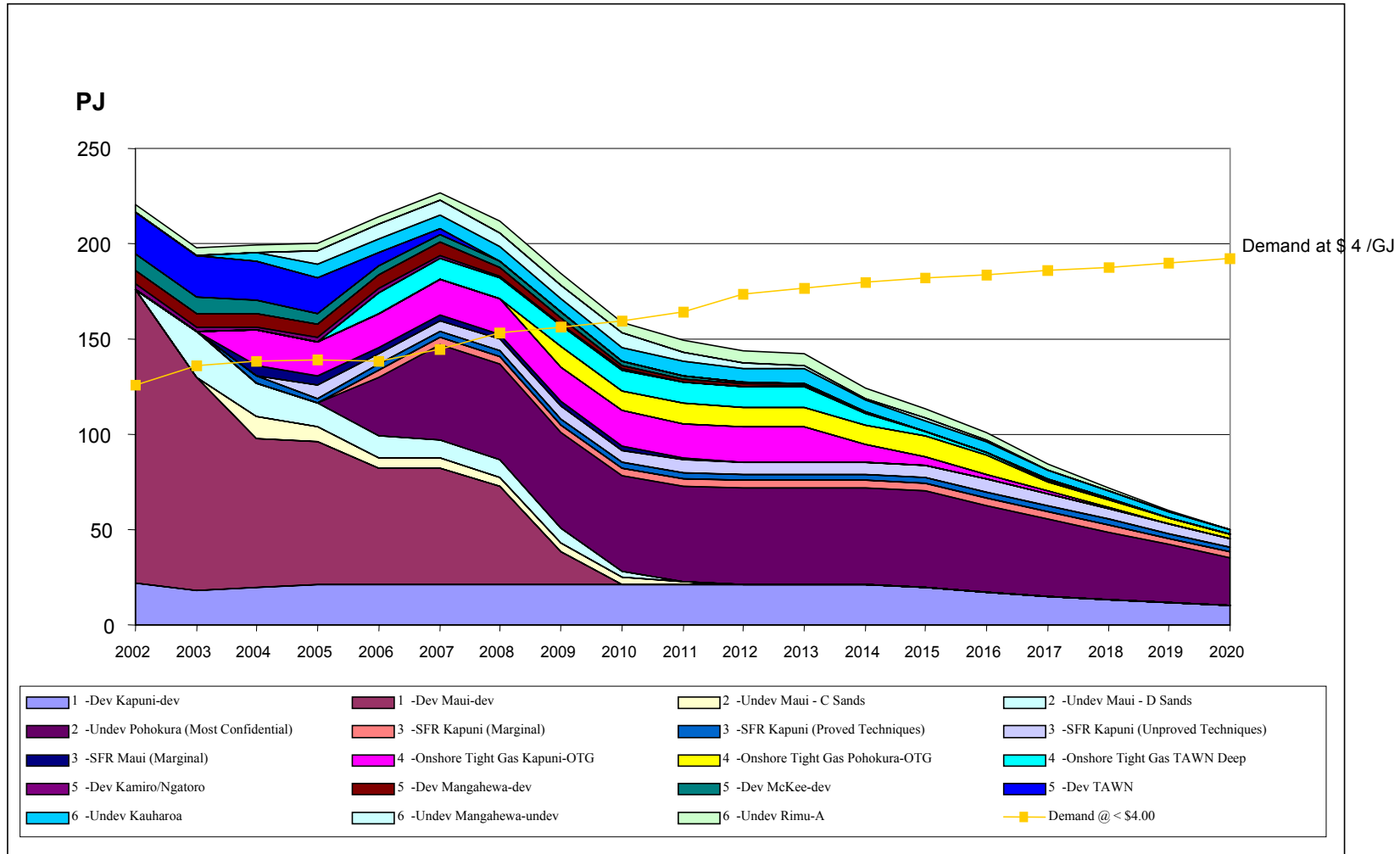
Issues:

- gas availability
- electricity security of supply
- oil security of supply

Gas Availability

- in recent years about 85% of our gas has come from Maui
- with rundown of Maui, future gas availability is critical
- key issues are:
 - residual volumes in Maui that are 'economically recoverable' at contracted prices
 - additional recoverable Maui reserves at higher prices
 - volume and timing of gas from Pohokura
 - volume, timing, location and cost of new gas discoveries
- Chart 4 suggests reserves are sufficient to meet demand at a wellhead price of \$4/GJ until 2010 (excluding Methanex)
- the 2010 date appears conservative since some of the surplus prior to 2010 could likely be carried over to post 2010

Chart 4: Gas Supply and Demand (unrisked at \$4/GJ ex-field)



Source: Shell NZ

Gas Availability [cont'd]

- Chart 4 excludes Kupe, and does not include any allowance for new discoveries
- with respect to gas availability indications are:
 - plenty of gas for the foreseeable future for the high volume reticulated market
 - may be insufficient gas at an acceptable price for Methanex
 - the amount available for electricity generation will in the longer run depend on the volume and cost of new discoveries

Gas Availability [cont'd]

- important factors are:
 - exploration is increasing
 - Crown Minerals Group in the Ministry is currently promoting a deepwater Taranaki bidding round
 - the royalty and permitting regime is internationally attractive (scheduled for review in 2003)
 - open access to the Maui pipeline and improved industry governance structures are required. Government decisions are expected soon

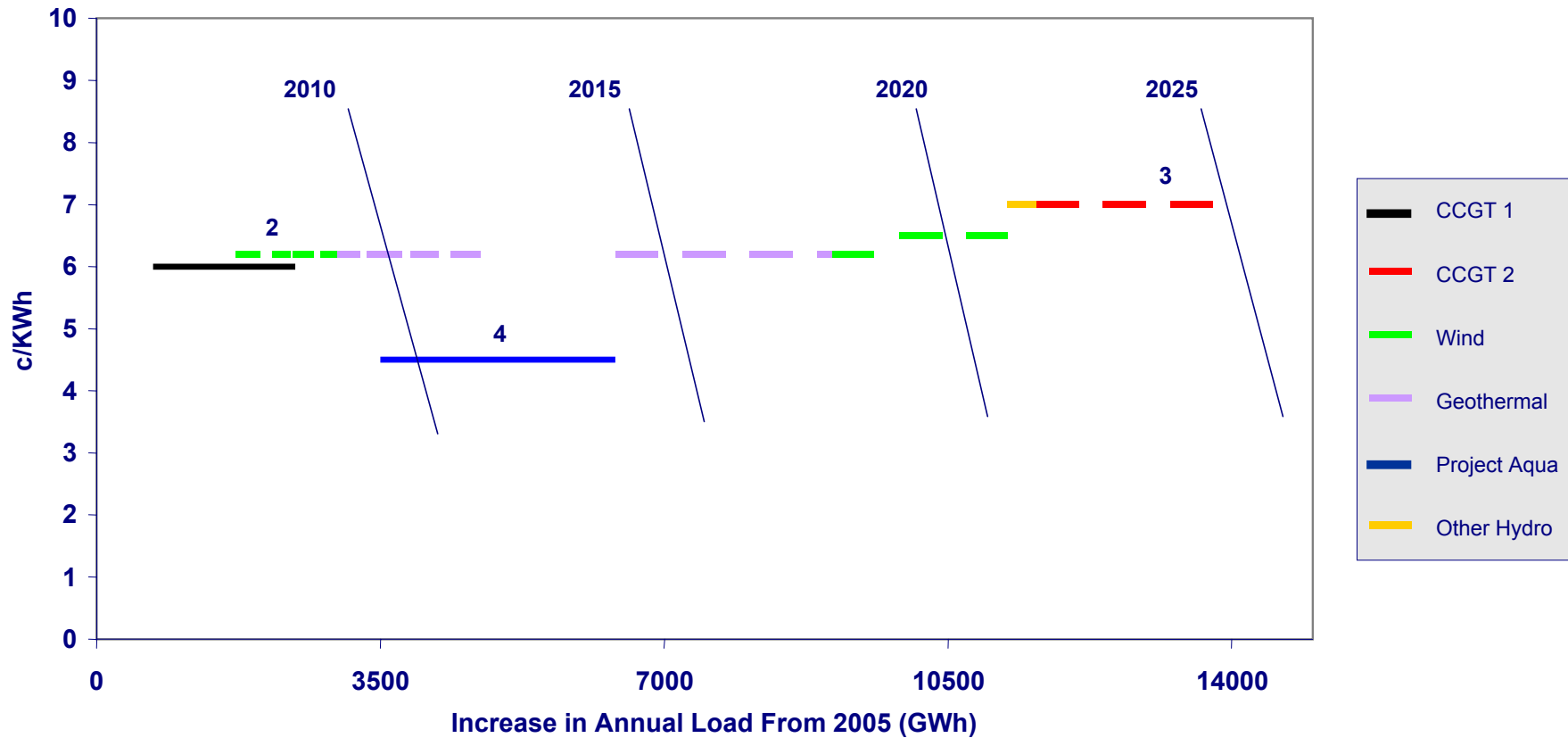
Electricity Security of Supply

- like other countries, New Zealand has to build new capacity to meet growth in electricity demand. (Need around 150MW or 800GWh pa)
- need to improve our ability to deal with the risk of dry years, especially given the expected early depletion of Maui

Chart 5: Electricity generation options

		C/kWh	MW	GWh/yr
Gas	2005	6.0	400	2,500
	2008-25 (C Charge)	7.0	800	5,000
Wind	2005-25	6.2 - 6.5	650	2,150
Geothermal	2005-25	6.2	600	4,800
Project Aqua	2008-12	4.0 - 4.5	570	3,200
Other hydro	2020-25	7.0	50	250
Cogeneration		5.0 - 8.5	350	2,500
LNG		9.5	no limit	no limit
Coal	(no C charge)	10.0	no limit	no limit
	(C Charge)	11.5	no limit	no limit

Chart 6: Cost of New Generation 2005 - 2005¹ (excluding cogeneration)



1. Projected demand growth is 700 GWh pa (excludes cogeneration).
2. Dotted line indicates uncertain sequence of development.
3. Includes carbon charge.
4. Meridian cost estimates at grid injection point.

Chart 7: New Generation Proposals: Public

Company	Type	Location	MW	GWH/yr	Expected Timing	Consents	Comments
Genesis	Gas (CCGT)	Huntly	360	3000	Dec-05	✓	Depends on availability of gas contacts
Contact	Gas (CCGT)	Otahuhu	400	3500	?	✓	Deferred pending gas contracts
Tuaropahi Power Trust	Geothermal	Mokai (expansion)	39	350	2004	Partial	
Geotherm Group	Geothermal	Tukairangi Rd	45	400	2006-7	Applied for	
Genesis	wind	Haunui	8	30	Dec-04	✓	Requires agreement on line connection costs
Meridian	Hydro (Project Aqua)	Lower Waitaki	285 + 285	1600 1600	2008 - 10 2010 - 12	No	

Electricity Security of Supply [cont'd]

- indications are that overall there is strong interest in building the required capacity to meet demand
- other important factors are:
 - electricity prices are expected to rise with increasing costs of new generation
 - climate change policy and the National Energy Efficiency and Conservation Strategy (NEECS) will put downward pressure on demand
 - further market developments may lead to greater demand side responsiveness
- while in broad terms it appears that required new capacity will be built, the exact level of dry year risk over the next 2/3 years is still unclear - more work is needed to more accurately assess this risk

Oil Security

- particular interest currently in the potential effects of a disruption to international oil supplies
- IEA established in 1974 specifically to act on behalf of member countries in such an event
- IEA has a security system that includes:
 - requiring member countries to hold at least 90 days' stock of oil products
 - arrangements for a co-ordinated response by members in the event of an emergency (responses may include stockdraw, surge production and, if necessary, reallocating supplies between members)
 - each member country having a National Emergency Sharing Organisation (NESO) (New Zealand's is chaired by the Ministry)
- Ministry is closely monitoring the situation - recently our stocks were at about 110 days' worth of oil (net import basis)

Concluding Comments

- MED is developing comprehensive energy supply/demand projections through to 2025
- various input material has been published:
 - Costs of Fossil Fuel Generating Plant (May 2002)
 - Availabilities and Costs of Renewable Sources of Energy for Generating Electricity and Heat (September 2002)
- expect full Outlook projections to be published early next year