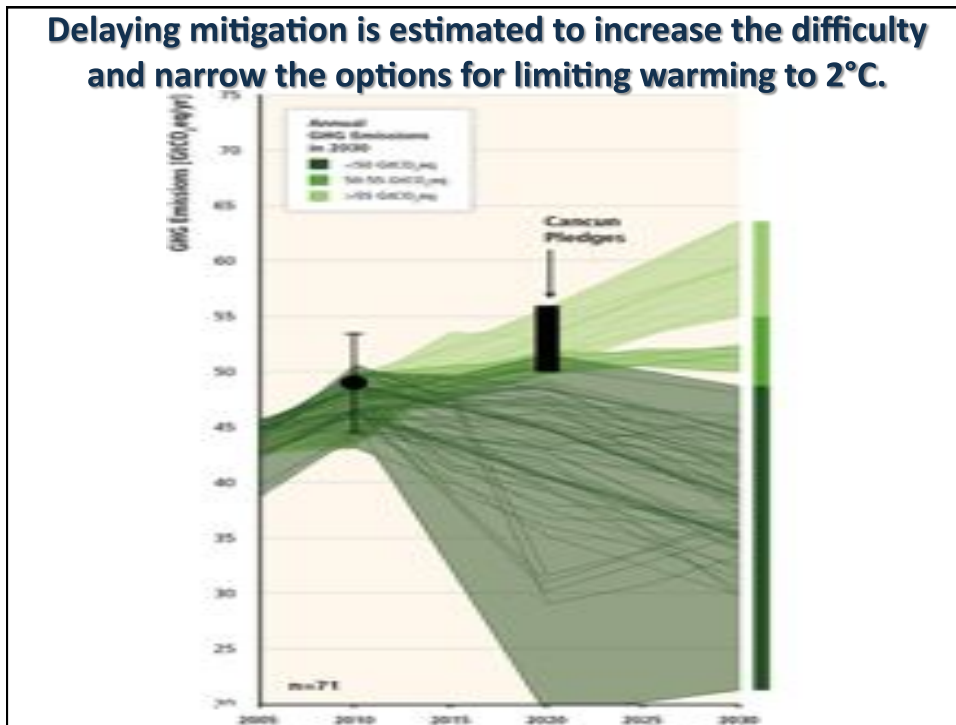
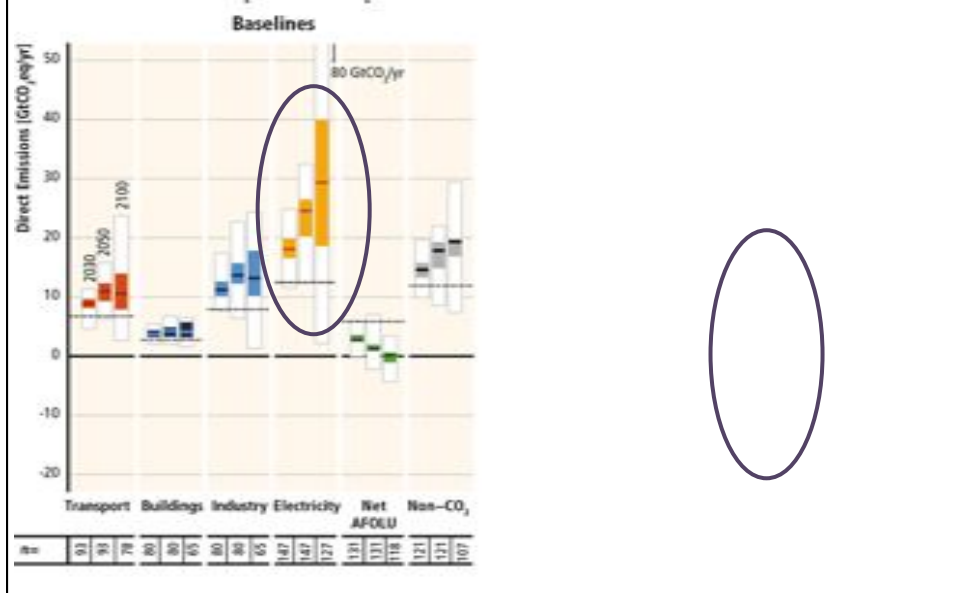


Delaying mitigation is estimated to increase the difficulty and narrow the options for limiting warming to 2°C.



Mitigation requires changes throughout the economy. Efforts in one sector determine mitigation efforts in others.

Direct Sectoral CO₂ and Non-CO₂ GHG Emissions in Baseline



What will be the costs of mitigation?

- Estimates vary widely but reaching 450ppm CO₂eq entails consumption losses of 1.7% below baseline growth by 2030 and higher losses later.
- For BAU, consumption growth of 1.6-3% per year over the 21st century, this is equivalent to a reduction by about 0.06 percentage points a year.
- Cost estimates exclude benefits of mitigation such as reduced impacts from climate change, improvements for local air quality and better health.



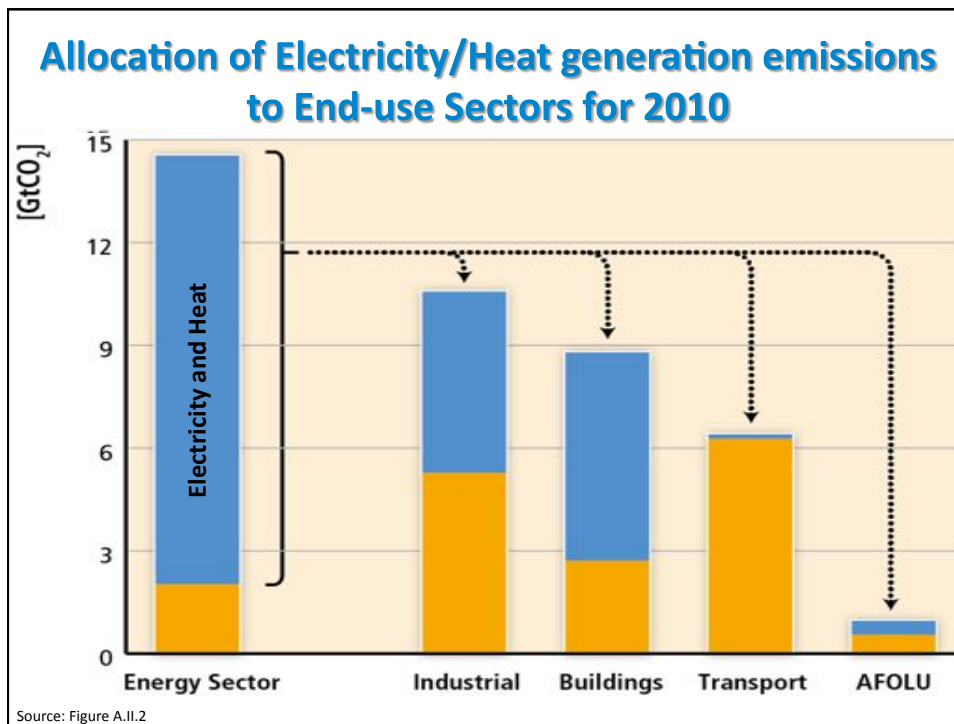
ipcc
INTERGOVERNMENTAL PANEL ON climate change

Overview of mitigation options for sectors:

- **Direct versus indirect sectoral emissions.**
- **Comparison of integrated and sectoral studies.**
- **Key messages from the sector chapters.**

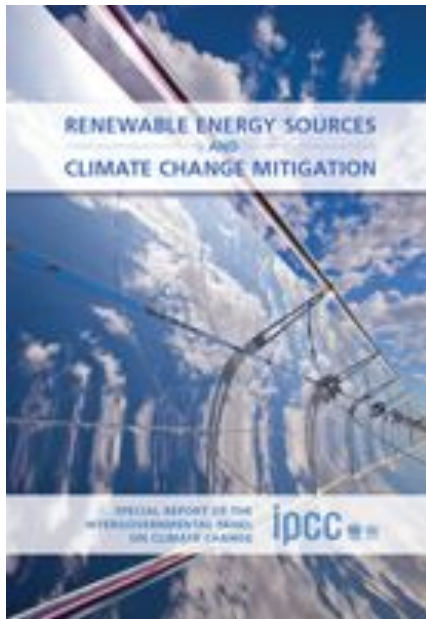
Working Group III contribution to the
IPCC Fifth Assessment Report



What are the mitigation options for Energy Supply ?

- Reductions in energy demand can provide flexibility in the up-scaling of energy supply technologies; avoid lock-in into carbon-intensive infrastructure; and increase the cost effectiveness of mitigation.
- Low-stabilization scenarios are dependent upon a full decarbonization of energy supply in the long term.
- A wide range of decarbonizing options are available now and provide flexibility in technology choice.
- Decarbonization of the electricity sector is projected to proceed faster than the switch to low-GHG energy carriers in the end-use sectors.
- Each low-carbon energy supply technology is associated with its own set of co-benefits, adverse side-effects and implementation challenges.

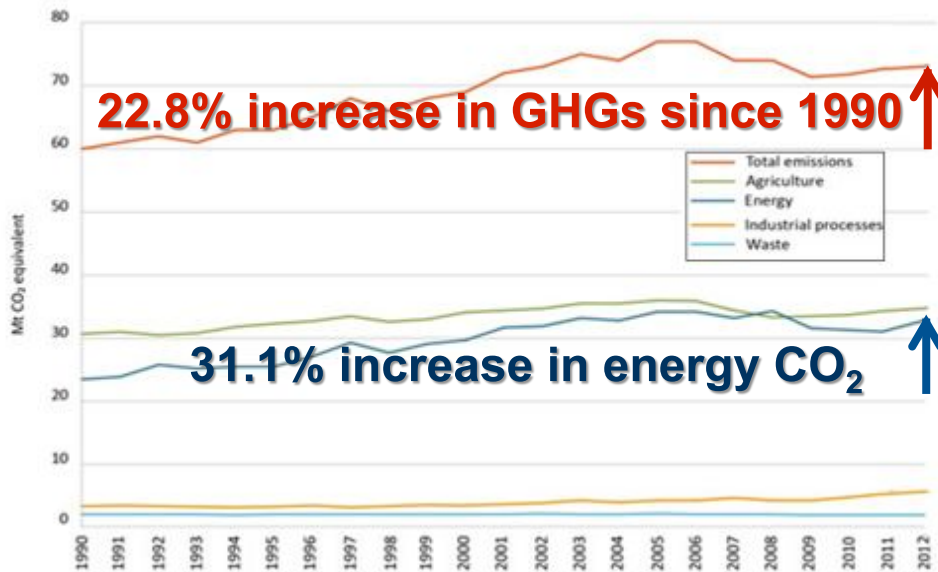


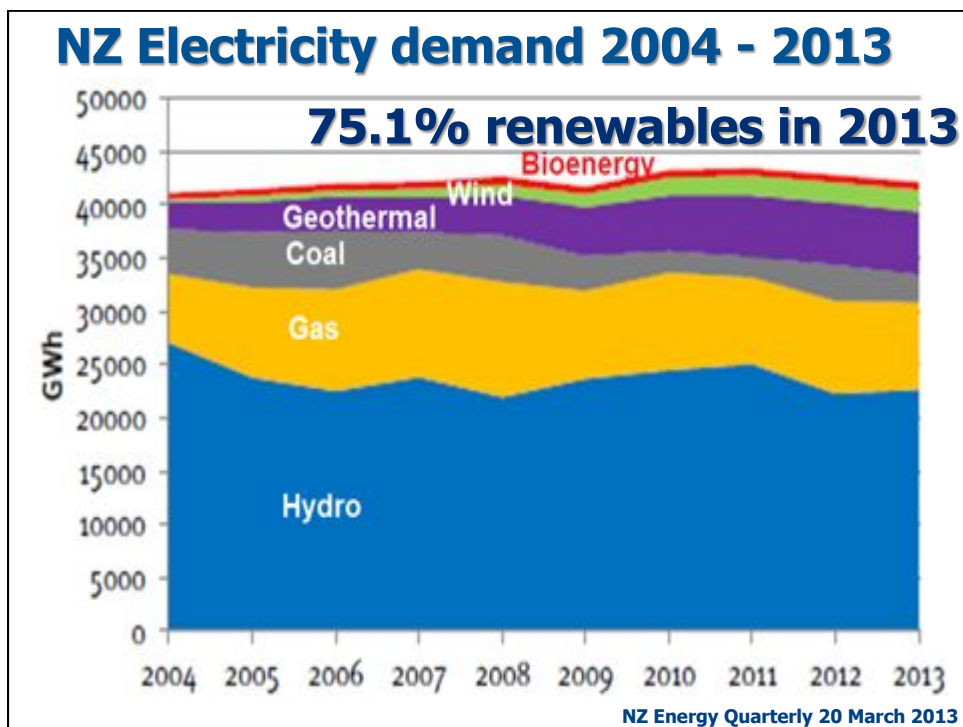
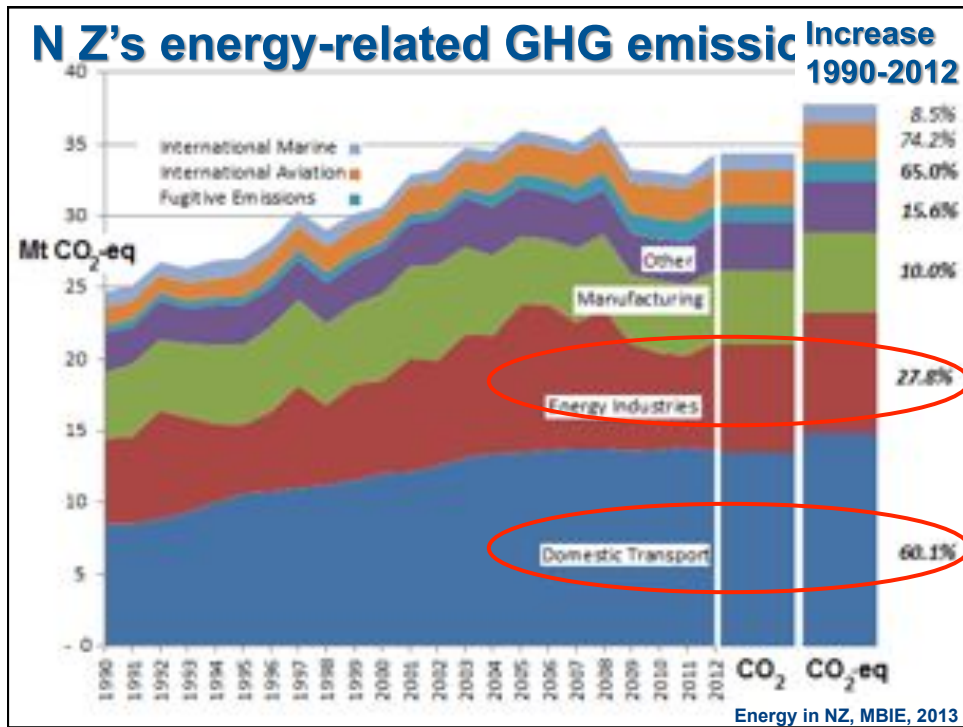
IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN)

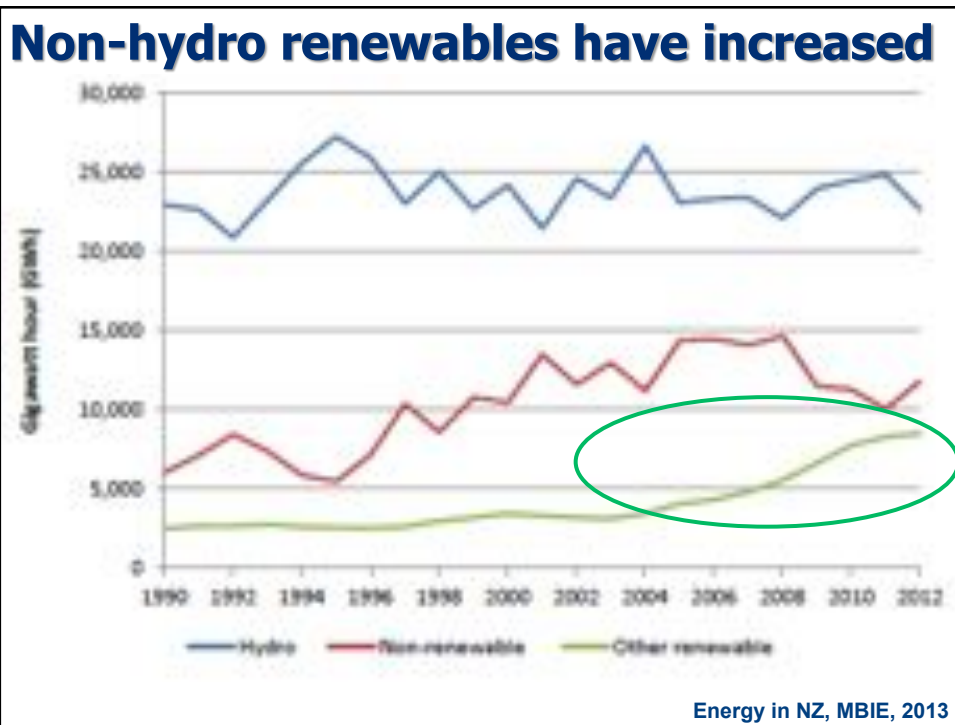
July, 2011.

<http://srren.ipcc-wg3.de>

New Zealand's total GHG emissions 1990 - 2012





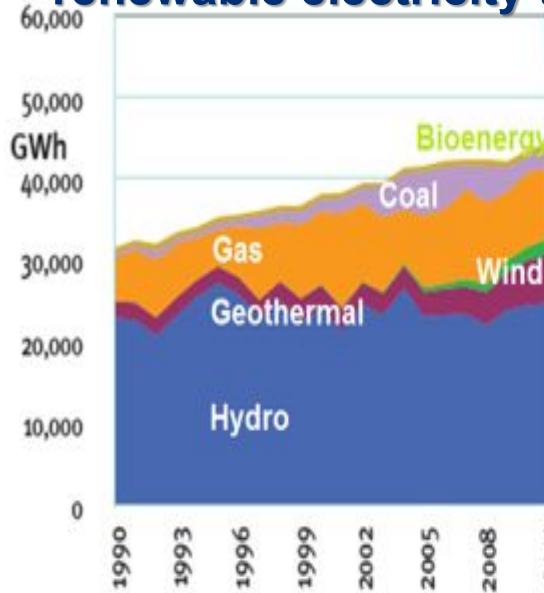


New Zealand's Energy Performance within an International Context

Electricity generation:



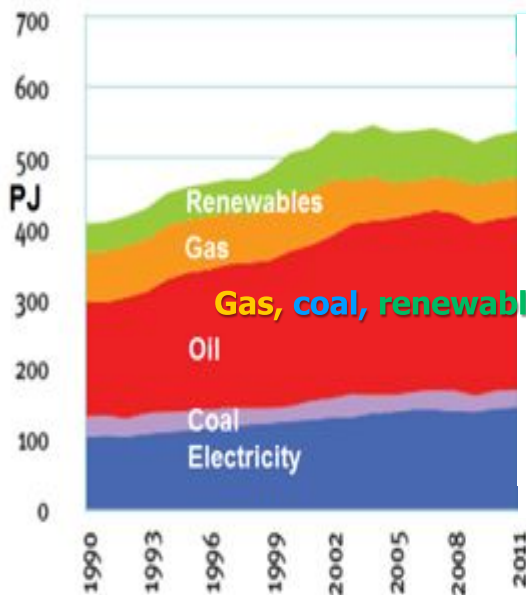
But..... what happened to the 90% renewable electricity target by 2025?



90%?
72%
projected share of renewables in 2025

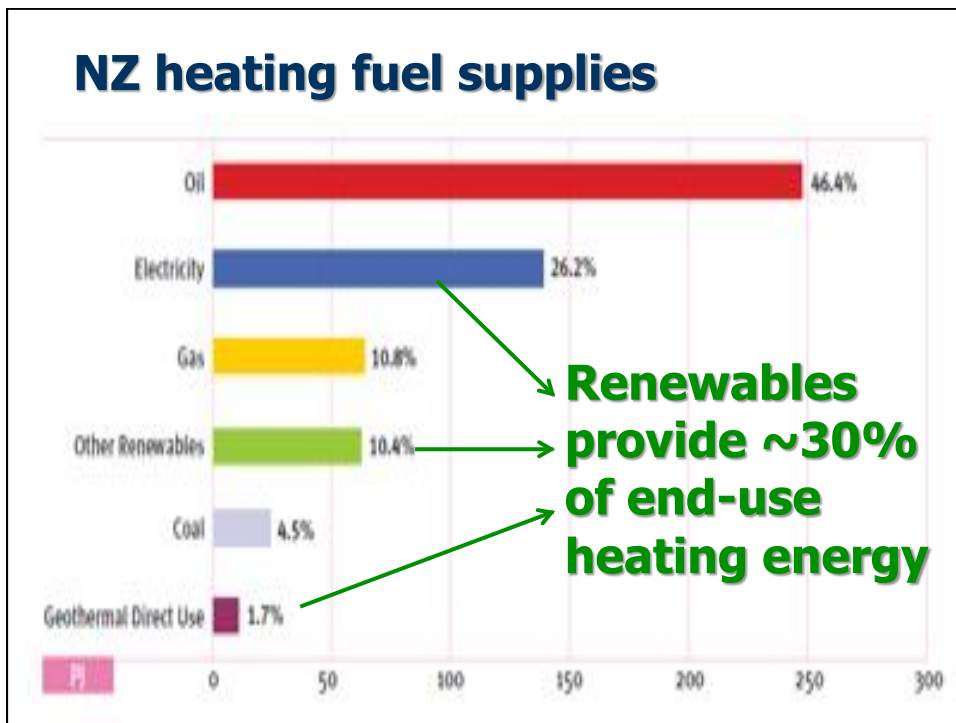
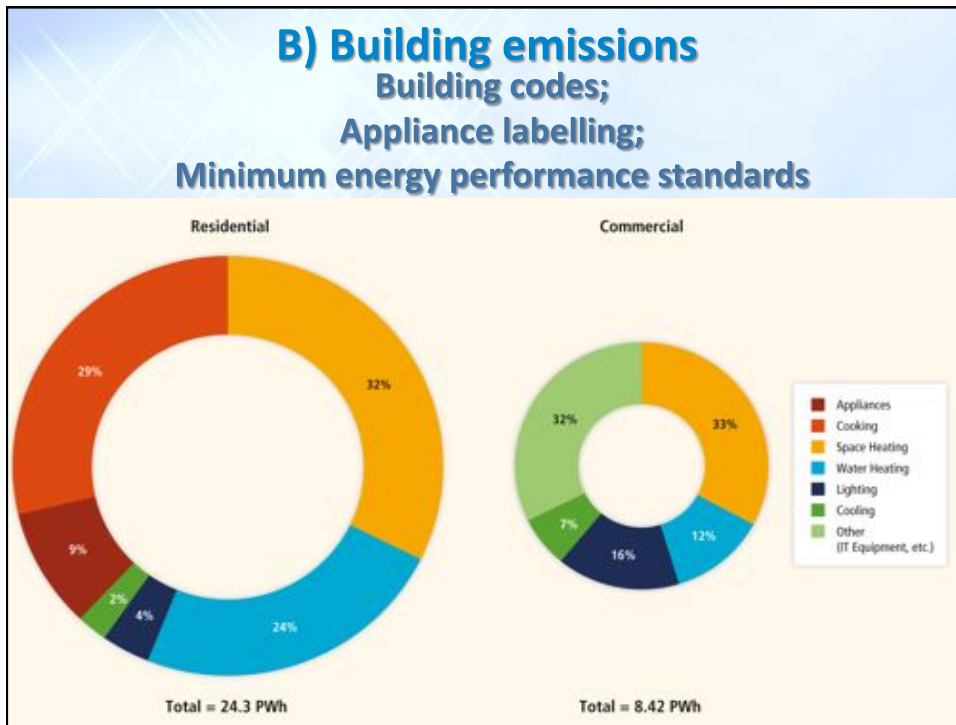
NZ's Energy Outlook, 2011, MED

N Z consumer energy demand



Gas, coal, renewables used mainly for heat.

NZ's Energy Outlook 2011, MED



C) Industry mitigation options

- Collaborative activities across companies and sectors, and especially SMEs through clusters, can reduce energy and material consumption and thus GHG emissions.
- Energy efficiency through wide-scale deployment of best available technologies, material recycling and behavioural change could reduce energy intensity by up to 25% in the short to medium term.
- In the longer-term, additional energy intensity reductions of up to 20% may be realized through innovation.
- GHG emission reductions can result from a greater shift to low-carbon electricity including for process heat.

New Zealand's Energy Performance within an International Context

Heat generation:

