New Zealand's Energy Choices

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New Zealand Government

sustainability

Key challenges

- Climate change
- Energy security
- Affordability

Choices

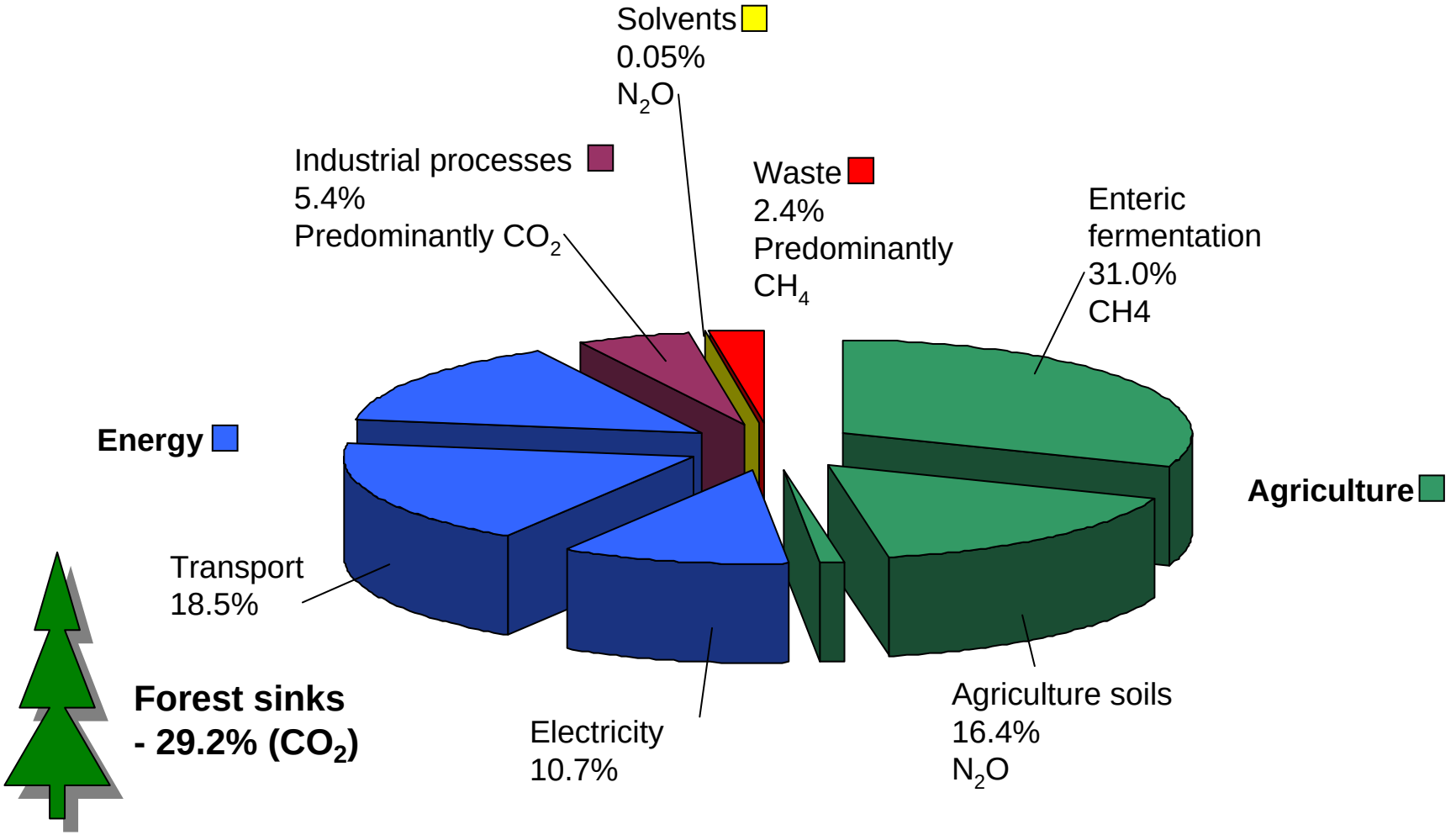
- To respond to these challenges, Government has made some key choices
- In short, the choices are designed to make the economy sustainable


“Why shouldn’t New Zealand aim to be the first country which is truly sustainable? Not by sacrificing our living standards, but by being smart and determined.”
- Prime Minister Helen Clark

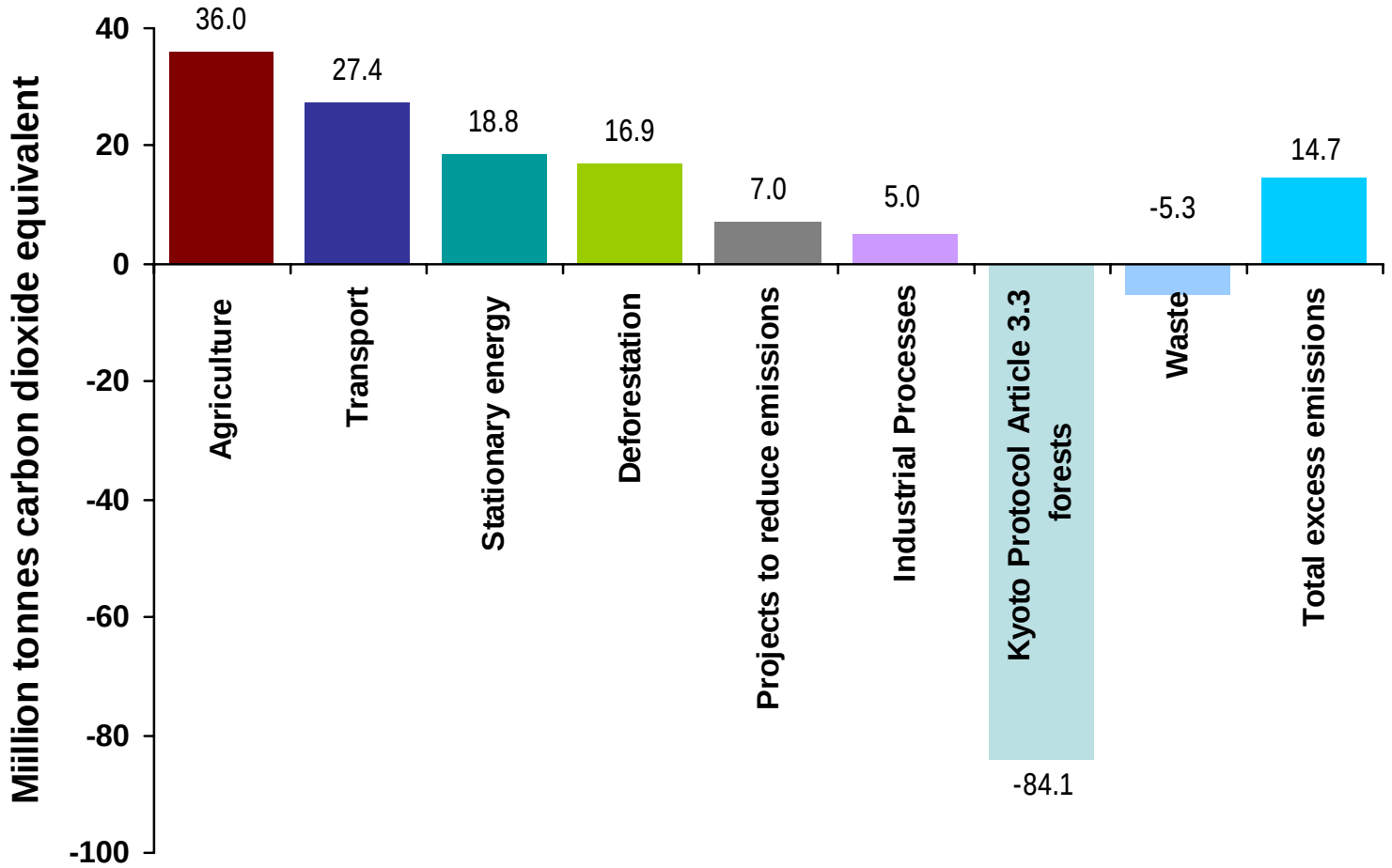
Climate change will change our natural environment

- Increased frequency of severe climatic events like droughts, floods, and storms
- Wetter in west, drier in east
- Changed growing seasons/regions
- Biosecurity risks

New Zealand's emissions



NZ's projected deficit has reduced dramatically for the 1st Kyoto Commitment Period



Climate Change Solutions

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Emissions Trading Scheme

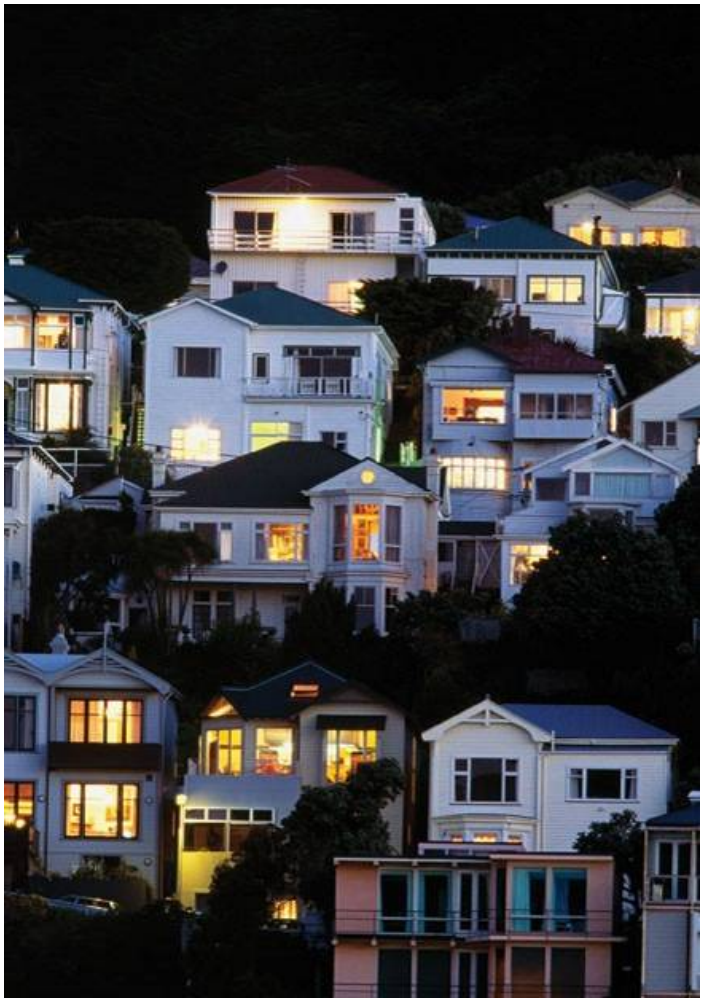
- Internationally favoured measure
- In line with others
- Includes every sector of economy –
  forestry, liquid fossil fuels, stationary energy/industrial processes, agriculture/waste/others
- Linked to Kyoto trading markets
- Gradual introduction

NZ Energy Strategy: Our vision

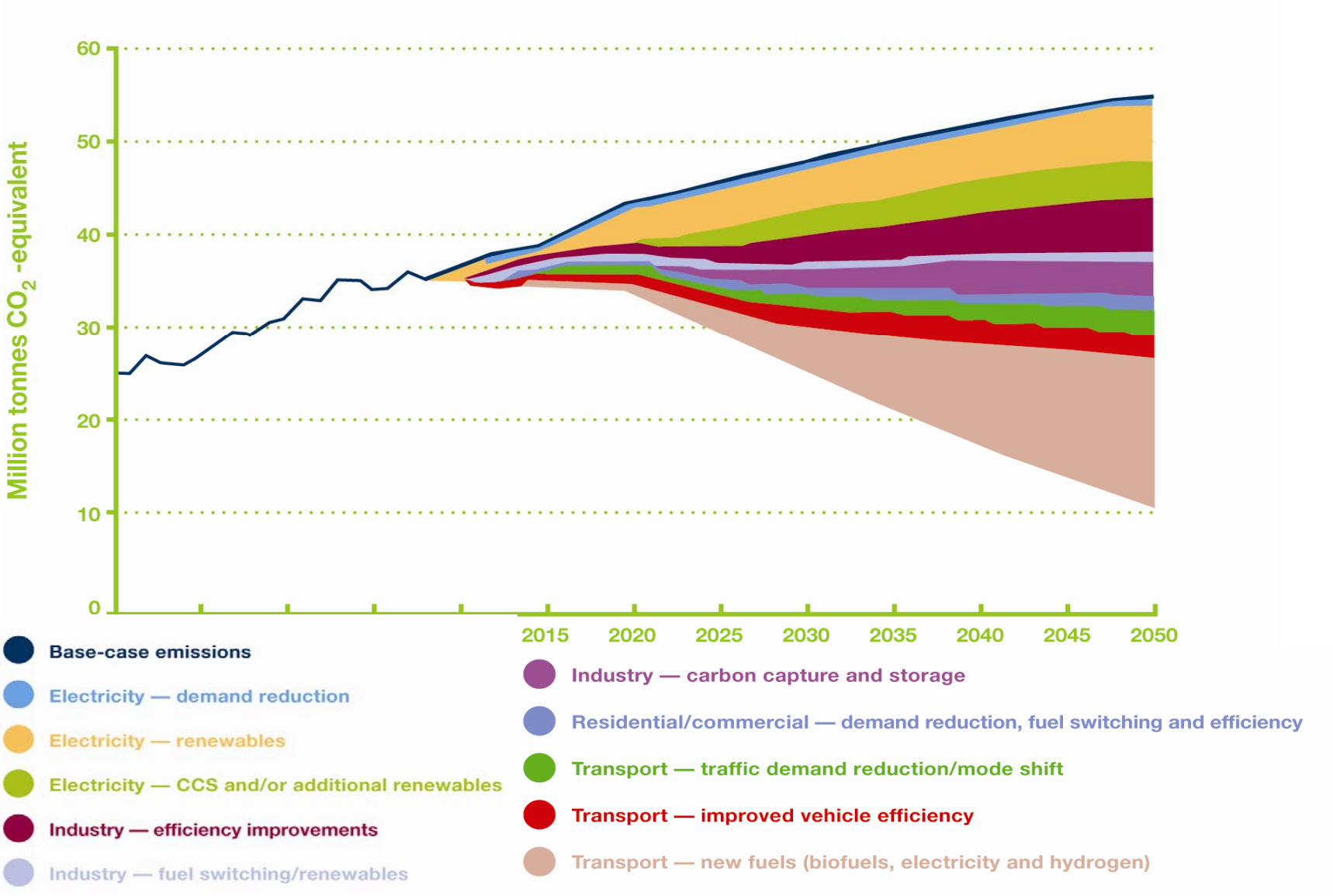
A reliable and resilient system delivering

New Zealand sustainable,

low-emissions energy



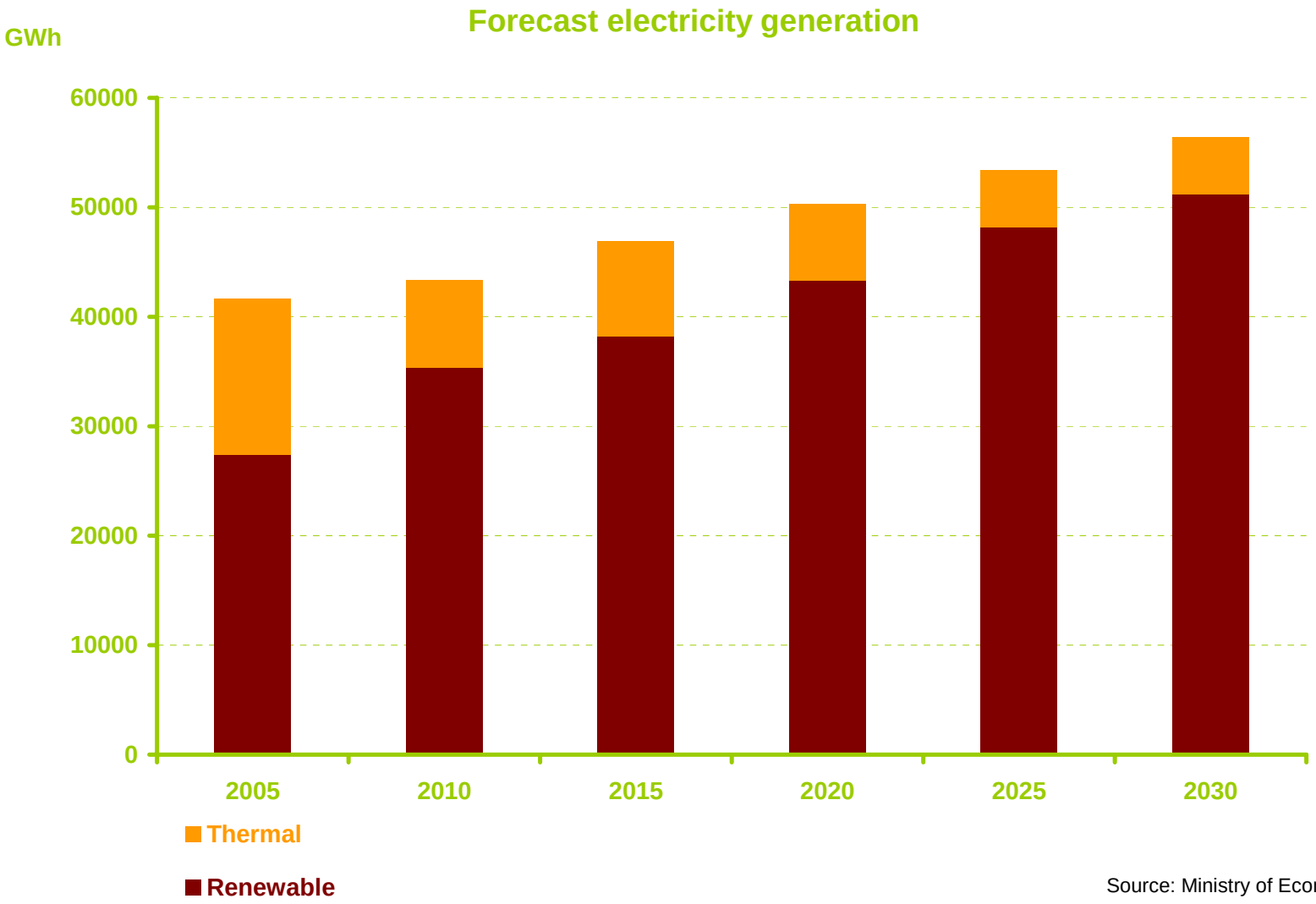
A sustainable low-emissions energy future



Renewable electricity target

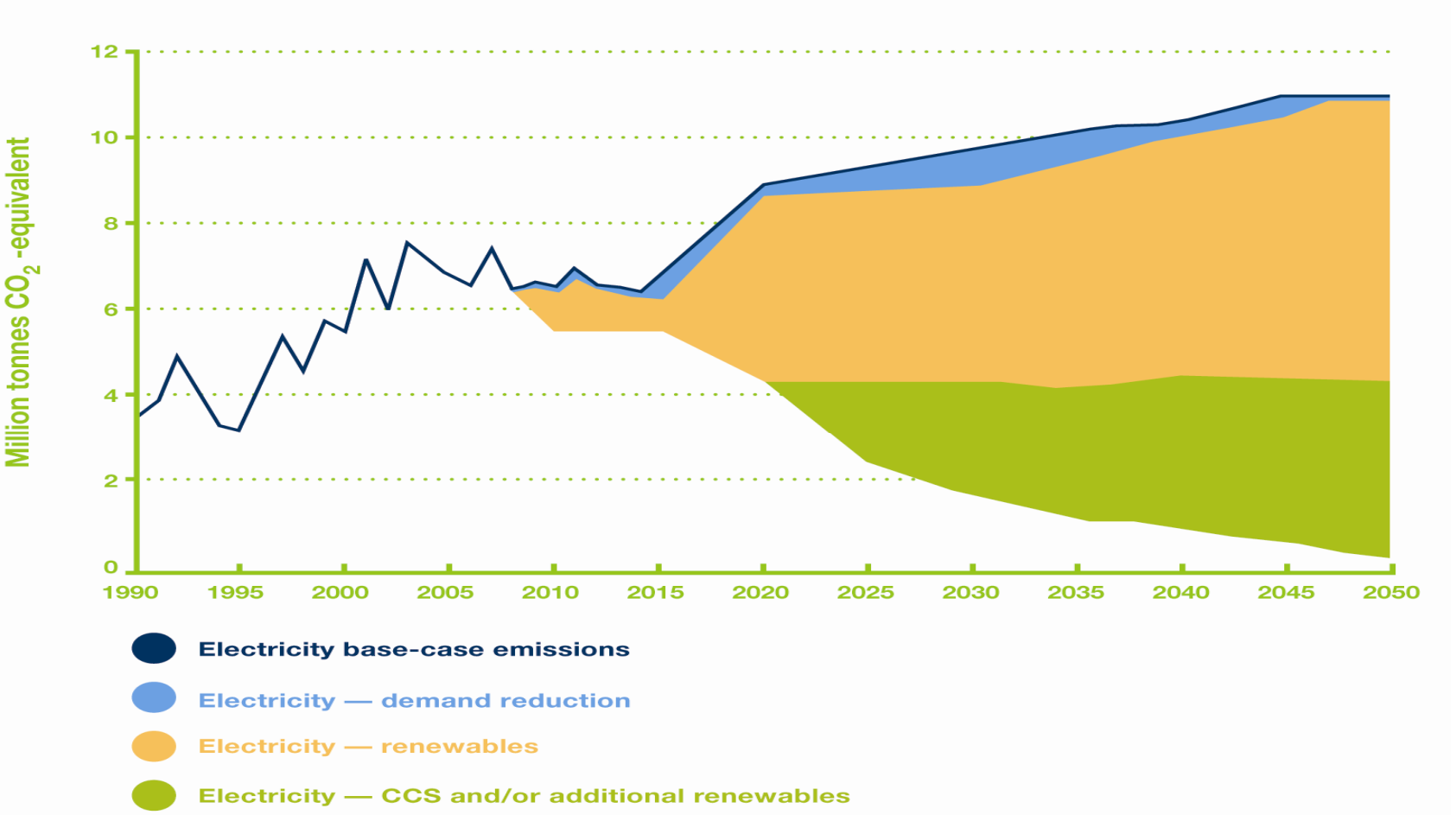
90 per cent of electricity from renewable sources by 2025

Forecast electricity generation



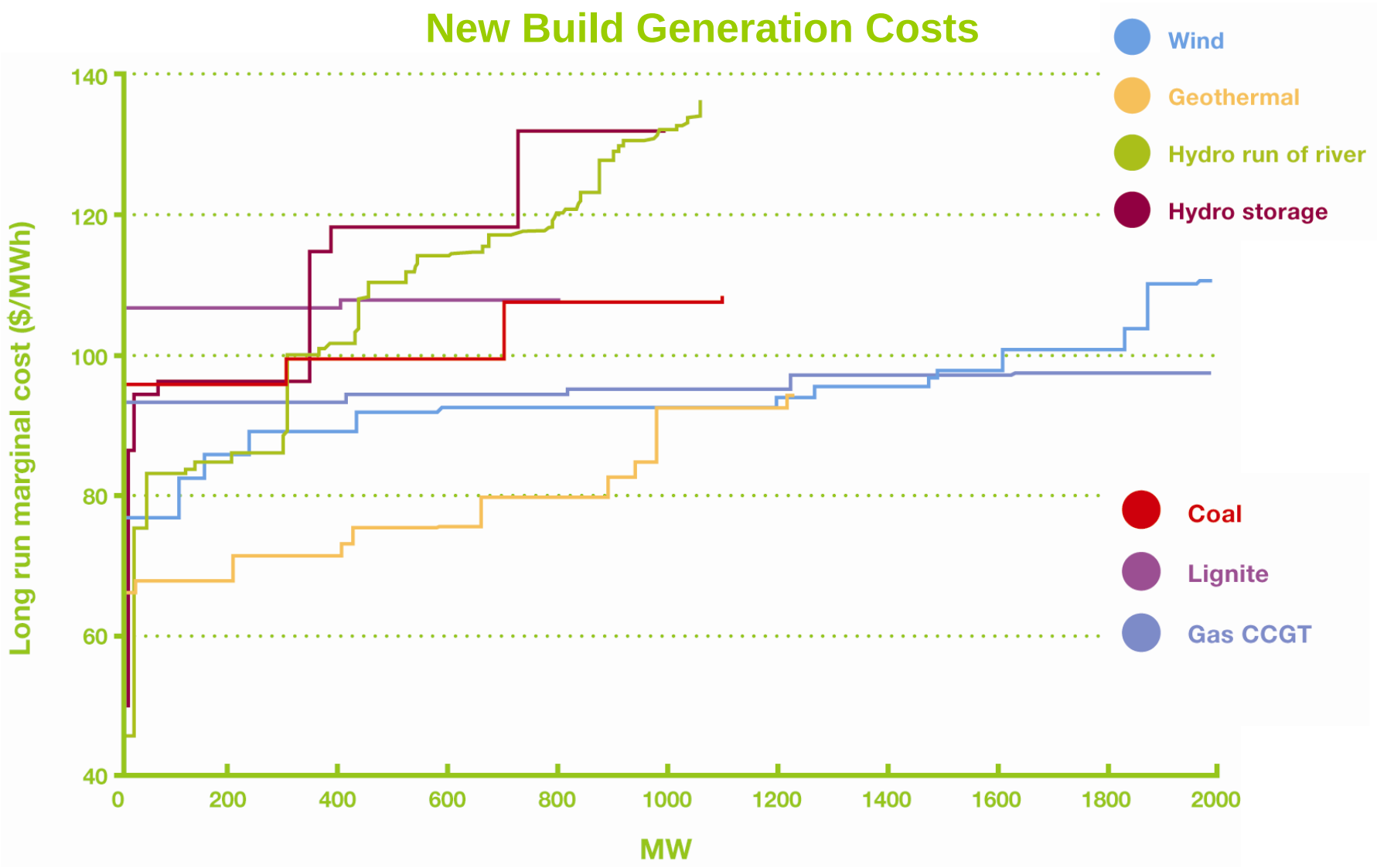
Source: Ministry of Economic Development

Emissions reduction opportunities in electricity



Source: Ministry of Economic Development

Renewables future - economic sense

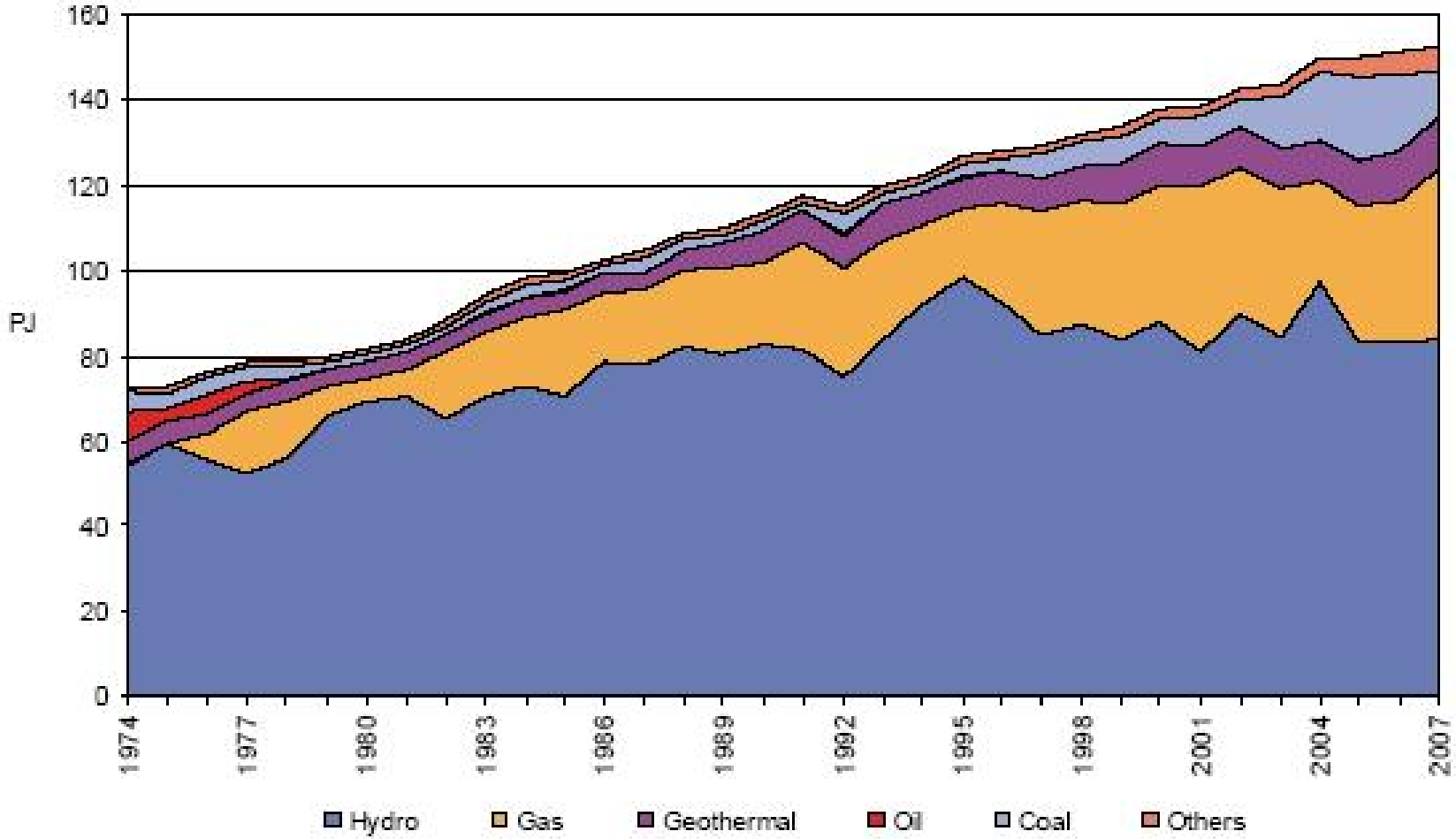


Key actions for renewables

- National policy statements on -
  - ✓ renewable electricity generation
  - ✓ electricity transmission

  - to provide guidance for councils
- Call-in powers available

Hydro energy



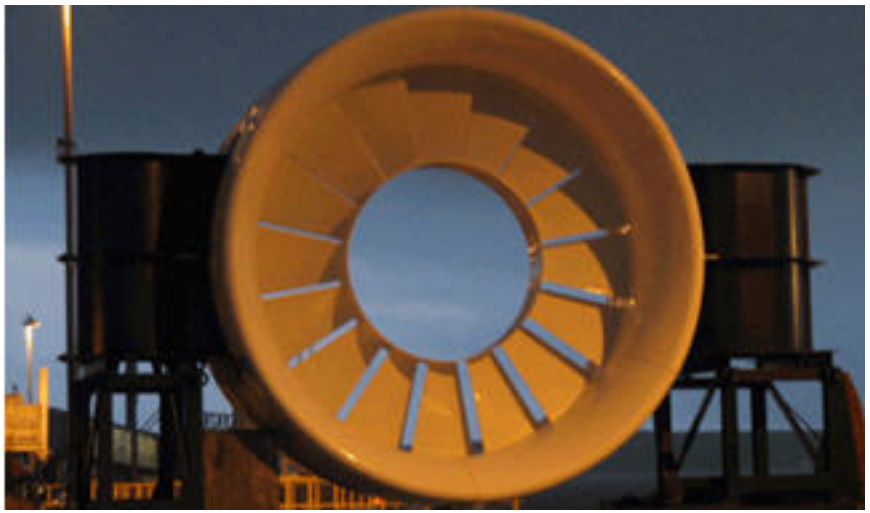
Wind energy

- Small proportion in New Zealand at present, but big potential
- Integration into grid

Geothermal

- NZ already a world leader in geothermal development
- 8% of electricity from shallow geothermal
- Untapped deep geothermal resource

Wave and tidal



- Marine Energy Deployment Fund: $8m over four years
- First award made to Crest Energy for $1.85m

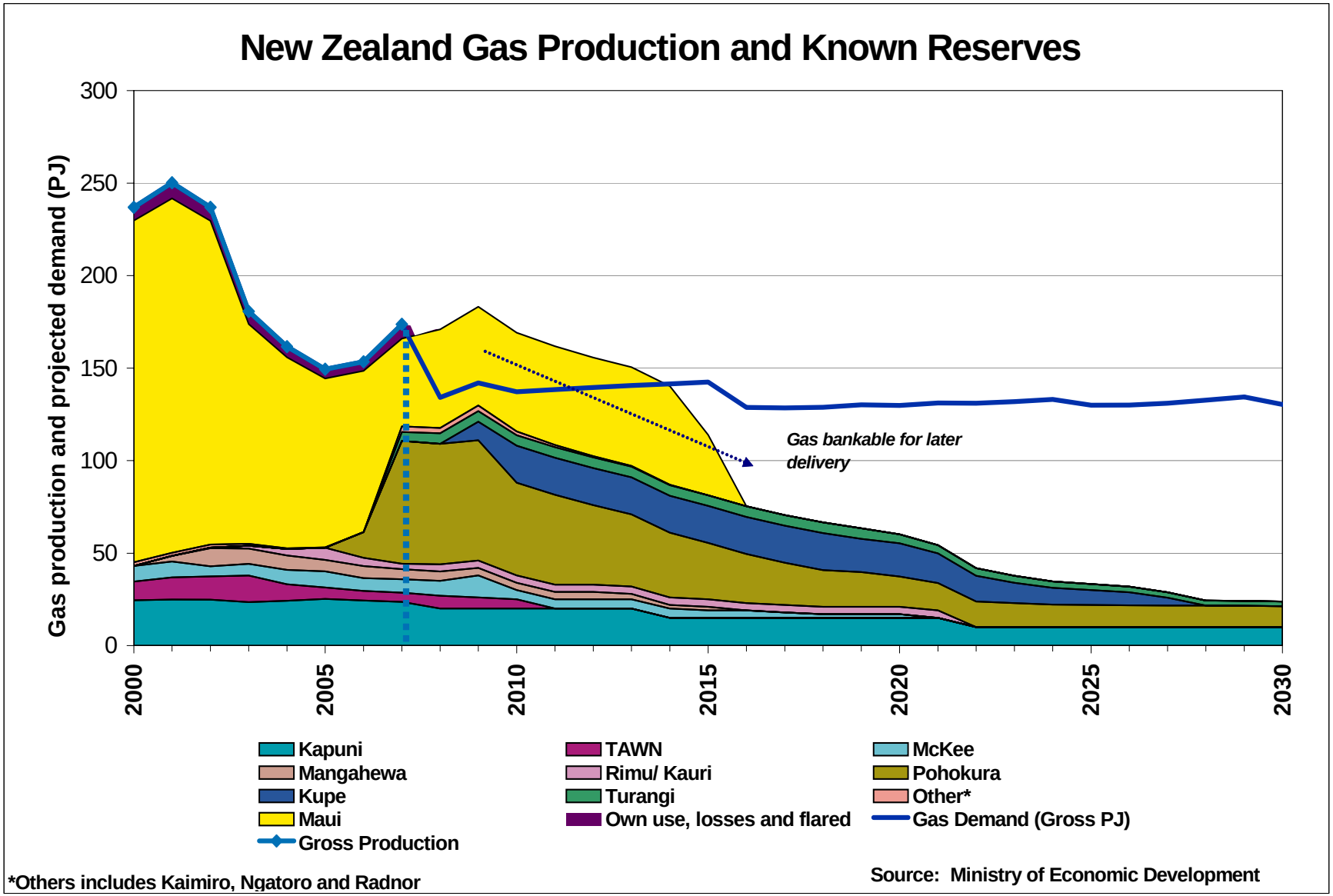
Role of fossil fuel generation

- All new electricity should be renewable except that for security of supply.
- Fossil fuel generation continues to play a critical role (particularly gas).

More gas discoveries needed

- New gas discoveries needed to meet our future domestic demand
- Indigenous sources are preferred over imports
- Onshore Taranaki Blocks Offer:
  - Enabling new gas discoveries
  - Opening up opportunities to maximise chances in the New Zealand gas market

More gas discoveries needed (cont'd)



The future for coal-fired electricity

- Huntly power station currently the only large user
- Huge lignite coal reserves

Carbon capture and storage (CCS)

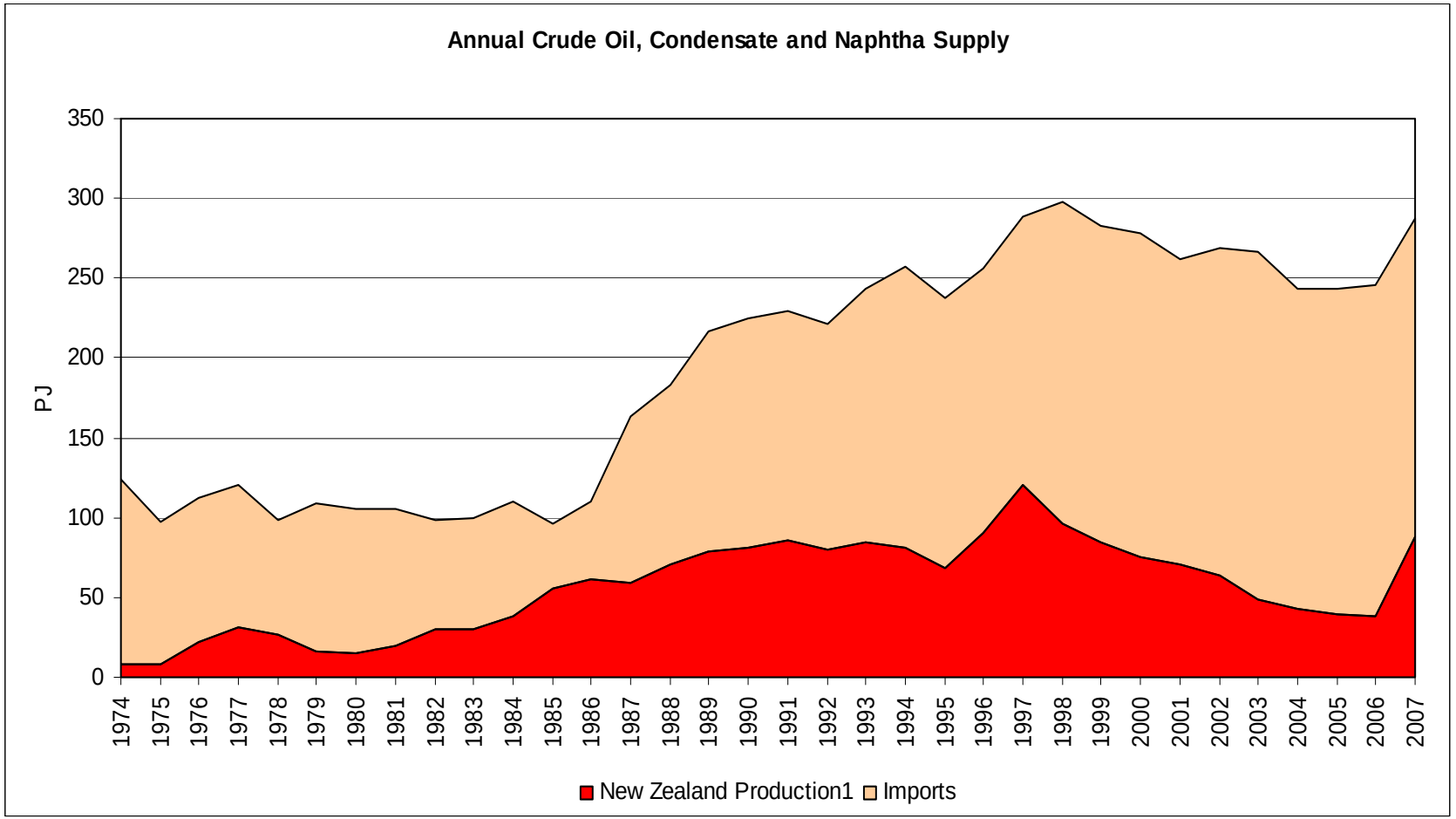
- CCS can provide low emissions supplies of energy from existing and new fossil-fuel generation.
- CCS still poses questions
- Much international research underway.
- Government policy group established to consider issues and regulatory options, including ensuring compatibility with ETS

- Identified CCS issues:
  - Storage liability
  - Ownership of CO2 and pore spaces

Resilient, low carbon transport

Halve domestic transport emissions by 2040, from 2007 levels

NZ’s dependence on imported oil

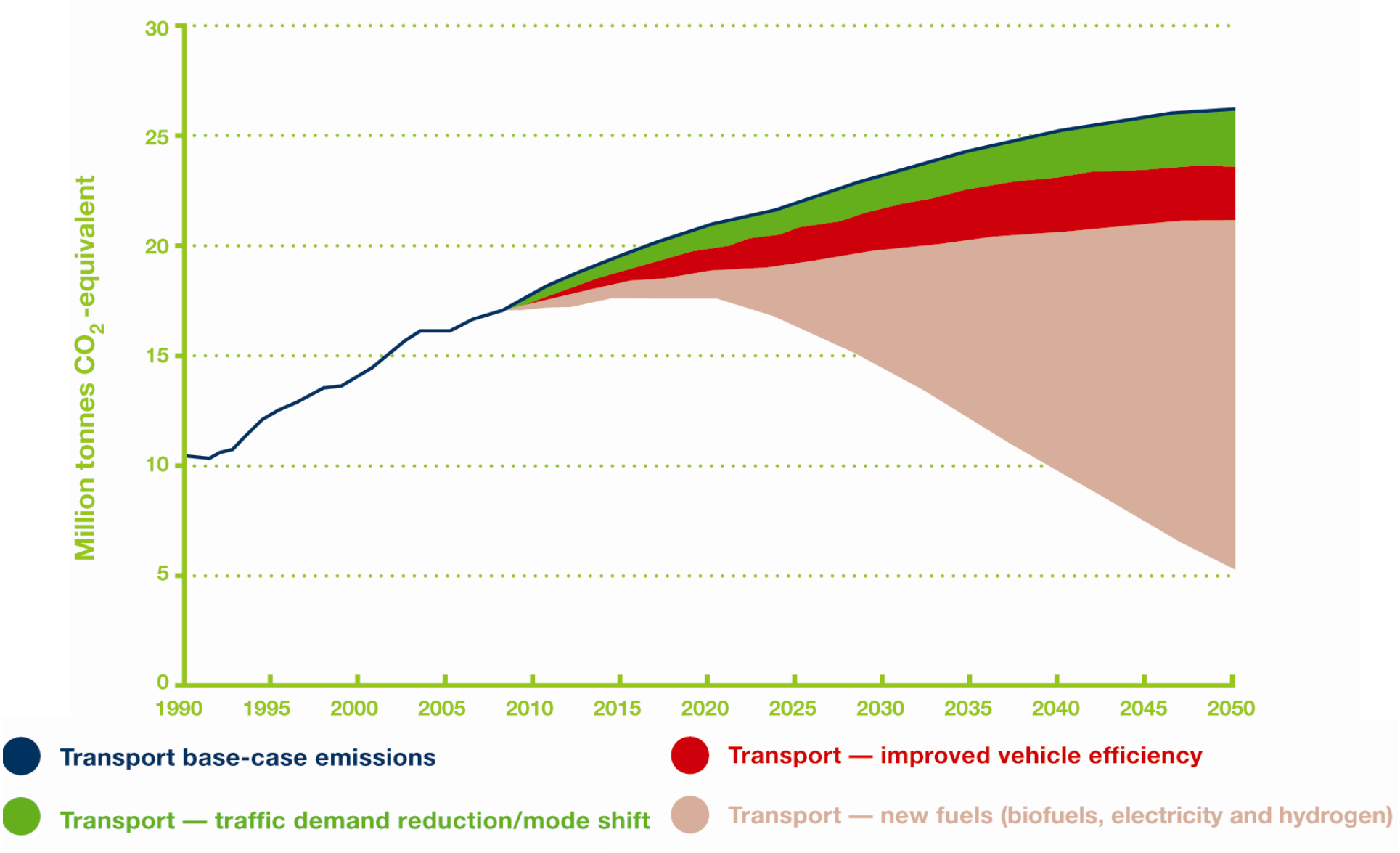


Realising the potential of New Zealand's petroleum estate

- Opportunities to discover world-class oil and gas deposits
- Potential overseas trading of large petroleum finds
- Positive indications: Tui and Maari oil fields
- Government actively encourages petroleum exploration and development

www.nzog.net/tui

Opportunities to reduce transport emissions



Biofuels

- Biofuel Bill (introduced in October 2007) will mean sales of biofuels are mandatory
- Sustainability standard being developed
- Second generation biofuels

Electric vehicles

- Low carbon future for transport essential
- NZ to be world leaders in using electric vehicles
- Powered by renewables
- ‘Smart grid’ needed to balance load
- Early models by 2010

Longer-term predictions

- Slow ramp-up from 2015, for new light vehicles
- 17% of light vehicle fleet plug-in hybrid or electric by 2030, rising to 60% by 2050
- 80% of travel in full electric mode
- Likely consumption around 8TWh (14% additional load) in 2050
- Potential to draw energy from batteries during peak load periods

Hydrogen

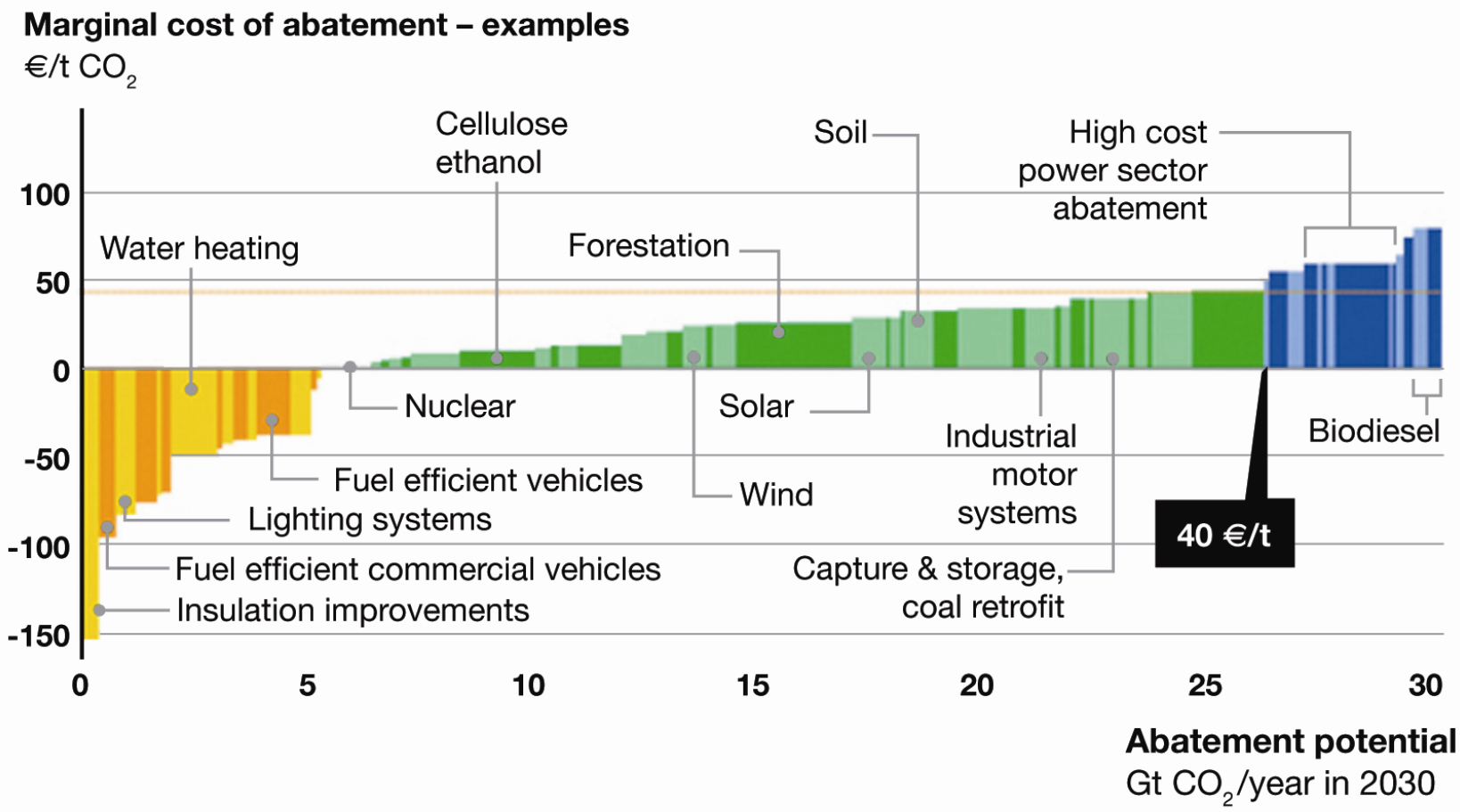
- Technological challenges
- International cooperation
- New Zealand can be a fast adopter
- Substantial lignite reserves
- Significant environmental challenges

Energy efficiency

- An untapped virtual source of energy
- NZEECS covers whole of economy, including vehicle efficiency
- Long-term major savings possible

Energy efficiency

Global cost curve



Building design

- Building Code changes mean better insulation and efficiency standards
- The future lies in smarter design to reduce energy use

Affordability

- Programmes to fund insulation
- Low Fixed Charge electricity tariff
- South Island customers

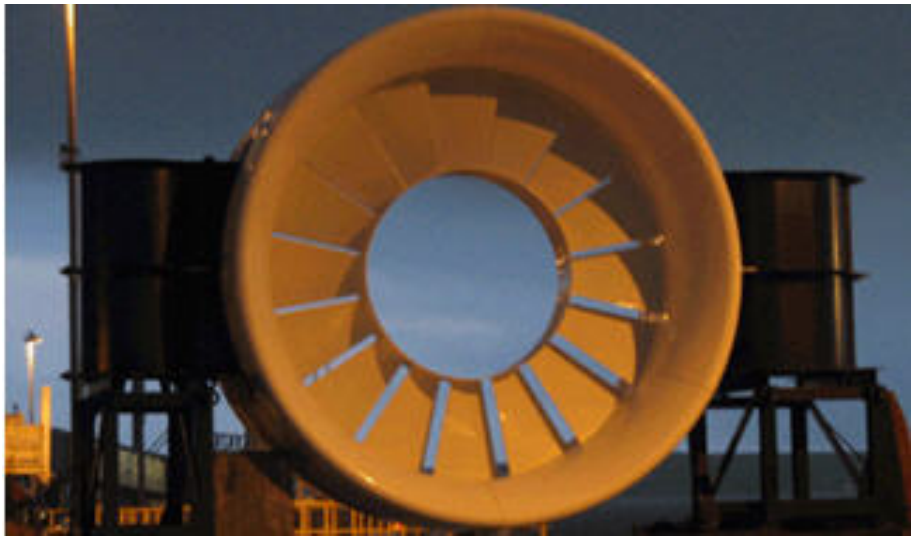
Technology and innovation

New technologies

- Need diverse mix of renewables
- Main increase over next decade will be wind and geothermal
- As island nation NZ has great potential for marine generation

Marine Energy Deployment Fund

- First grant – Crest Energy for Kaipara Harbour entrance project
- Will improve reliability of supply to local community
- Further funds available in Round 2



Role of research and education

Universities contribute:

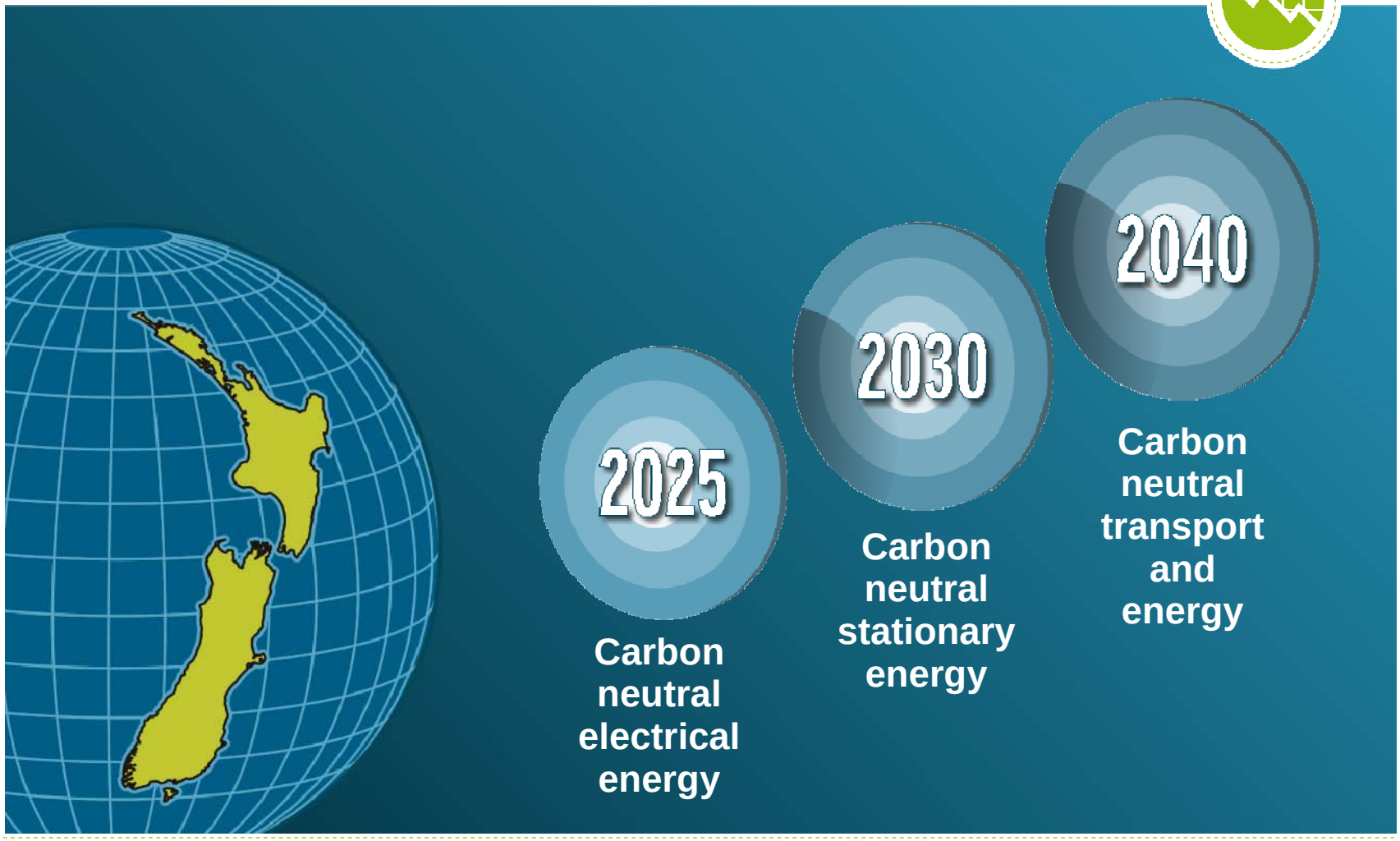
- Research on behavioural and technological issues
- Scientific understanding and analysis of our energy resource base, climactic data, adaptation and mitigation issues
- Analysis and presentation of views to inform public debates and policy development

Funding for sustainable development research

Budget 2008: $32.5m over 4 years:

- $10 m for renewable energy research
- $18.5m for transformation Research, Science and Technology
  - Includes $4m for the Low Carbon Energy Technologies (LCET) Fund
- $4m for deep geothermal energy research

Towards a carbon neutral New Zealand



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