How did we get there from here?

Key ingredients for an effective, efficient and just path to low emissions

Suzi Kerr, Motu Economic and Public Policy Research
Australia-New Zealand Climate Change and Business Conference
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Where is ‘there’?

Limit temperature rises below 2ºC

The world transitions to a zero-net-emission economy by the end of this century

New Zealand (and Australia) transition even faster...

and help other countries along the way.
Net-Zero Emissions Future Vision

NZers have access to secure, resilient and affordable zero-net-emission energy to power their homes and businesses.

NZ's economy is resilient, adaptive, globally networked and socially equitable, contributing to new opportunities and a high quality of life.

NZ's transport system ensures efficient, resilient and affordable zero-net-emission mobility for people and goods.

NZ's forest sector supports carbon sequestration and biofuel production while safeguarding ecosystem services and economic, social and cultural value.

NZ operates a highly efficient, ultra-low-emission food production system.
Change is continuous

Alternative is not status-quo.
We need to bring in the new – and usher out the old.
Net-Zero-Emissions Future

Low well-being

High well-being

We are here
Driving a Net-Zero Emissions Future

- Zero-net-emission electricity – utility and distributed
  - Enhanced electricity grid and new energy storage infrastructure
    - Industrial heat powered (primarily) by electricity or renewable fuels
    - Reduced demand for emission-intensive goods and services through product substitution and climate-smart behaviour
    - Smart high-density urban design
      - Ultra-GHG efficient ruminant production
      - Forest management for sequestration and biofuels
    - Enhanced transport infrastructure
      - Transport powered (primarily) by electricity or renewable fuels
      - Increased non-ruminant, low-N₂O food production
  - Enhanced transport infrastructure
  - Reduced demand for emission-intensive goods and services through product substitution and climate-smart behaviour
  - Smart high-density urban design
    - Ultra-GHG efficient ruminant production
    - Forest management for sequestration and biofuels
  - Enhanced electricity grid and new energy storage infrastructure
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      - Forest management for sequestration and biofuels
    - Enhanced transport infrastructure
      - Transport powered (primarily) by electricity or renewable fuels
      - Increased non-ruminant, low-N₂O food production
  - Zero-net-emission electricity – utility and distributed

Offsetting of residual emissions by CCS or other means
2050 Pathway Linkages

Stationary energy (electricity and heat)
- Electricity demand
- Electricity storage
- Urban design
- Biofuel supply/demand
- Wood processing
- On-farm electricity/heat
- Industrial food production
- Fertiliser production
- Biofuel supply/demand

Forestry (emission offsetting, biofuel supply)
- Biofuel supply/demand
- Wood processing
- Wood transport to market
- Biofuel supply/demand
- Competition for land use

Transport (road, rail, maritime, aviation)
- On-farm transport
- Food transport to market
- Biofuel supply/demand

Agriculture (livestock and cropping)
Who Will Make Change Happen?

Central and local government
- Goal setting
- Policy and regulation
- Environmental citizenship

Civil society
- Goal setting
- Social license to operate
- Consumer demand
- Setting research priorities

Businesses
- Goal setting
- Informed decision making
- Technology R&D
- Commercialisation
- Deployment supply/demand

Academic and research institutions
- Goal setting
- Policy and regulation
- Informed decision making
- Setting research priorities
- Research funding
But we don’t know where we are going!

Consider the consequences of options

Make decisions

Maintain and expand options
But we don’t know where we are going!

Zero carbon electricity production

Mt CO$_2$e/yr

2015

20?

BAU emissions, low-cost fossil fuel scenario

Demand management

Distributed renewable generation

Utility renewable generation

Gas-fired generation with CCS
But we don’t know where we are going!

Mt CO$_2$e/yr

BAU emissions, low-cost fossil fuel scenario

Demand management

Distributed renewable generation

Utility renewable generation

Gas-fired generation with CCS

Some fossil generation decommissioned

Major natural gas find; do we develop it hoping for CCS?

2015

20?
What if we choose the gas route?

- BAU emissions, low-cost fossil fuel scenario
- Demand management
- Distributed renewable generation
- Utility renewable generation
- Gas-fired generation with CCS

- Major natural gas find; decision to develop it hoping for CCS
- Some fossil generation decommissioned

Mt CO$_2$e/yr

2015

20?
Technology might come through

Mt CO₂e/yr

BAU emissions, low-cost fossil fuel scenario

Demand management
Distributed renewable generation
Utility renewable generation
Gas-fired generation with CCS

Some fossil generation decommissioned
Major natural gas find; decision to develop it hoping for CCS
CCS becomes economic

2015
20?
But it might not – how do we make sure we are prepared?

Mt CO$_2$e/yr

- BAU emissions, low-cost fossil fuel scenario
- Demand management
- Distributed renewable generation
- Utility renewable generation

Some fossil generation decommissioned

Major natural gas find; decision to develop it hoping for CCS

CCS is too expensive; announce future ban on gas.

2015

20?
Is this a more cautious alternative?

Mt CO$_2$e/yr

BAU emissions, low-cost fossil fuel scenario

Demand management

Distributed renewable generation

Utility renewable generation

Some fossil generation decommissioned

Major natural gas find; don’t develop it yet but still hope for CCS?
NZ and a zero net emission world
Help others to help us
We are like a developing country
Our innovations – especially in actions – might work for them
We are liked and trusted
We can tell our stories and share our skills better – and may be able to export.

But it is hard – we need to do it systematically
Can this be done with business?
How do we get there from here?

Look back from success
- generates more ideas, and avoids despair

We can’t predict the path
- Use imagination and careful thought
- Maintain and enhance options

A multitude of actions and actors

Most mitigation will happen in developing countries
- let’s be an active part of that

Need for broad social process
- Transparent
- Well-informed
- Trusted
- Wide range of perspectives

A leaders’ group to frame a net zero emission vision that everyone can support?

An ETS review outside government?