

# Climate, Emissions Pricing and Renewables

*Suzi Kerr*

*Motu Economic and Public Policy Research*

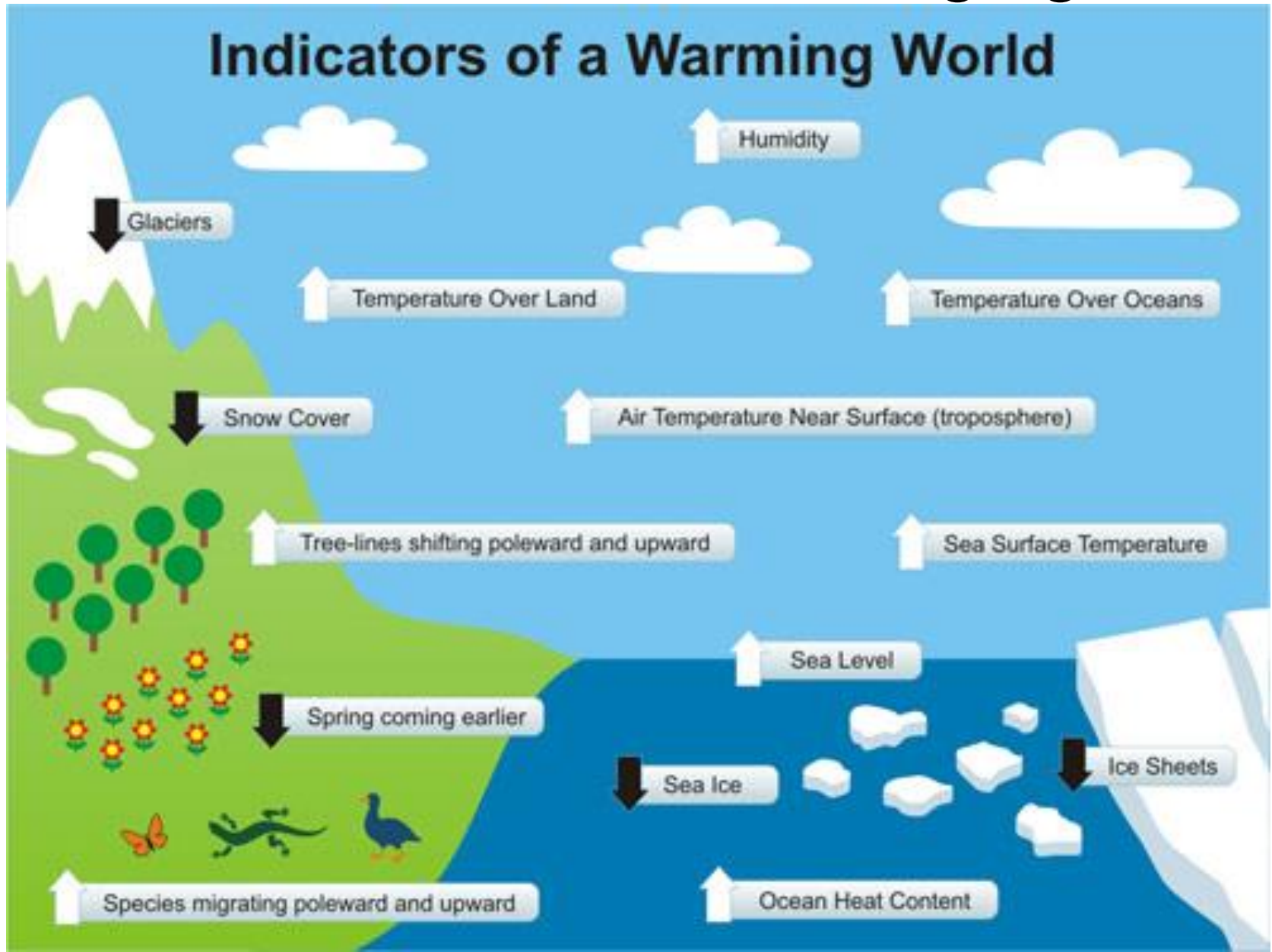
Shaping New Zealand's Low Emissions Future

<http://low-emission-future.blogspot.co.nz/>

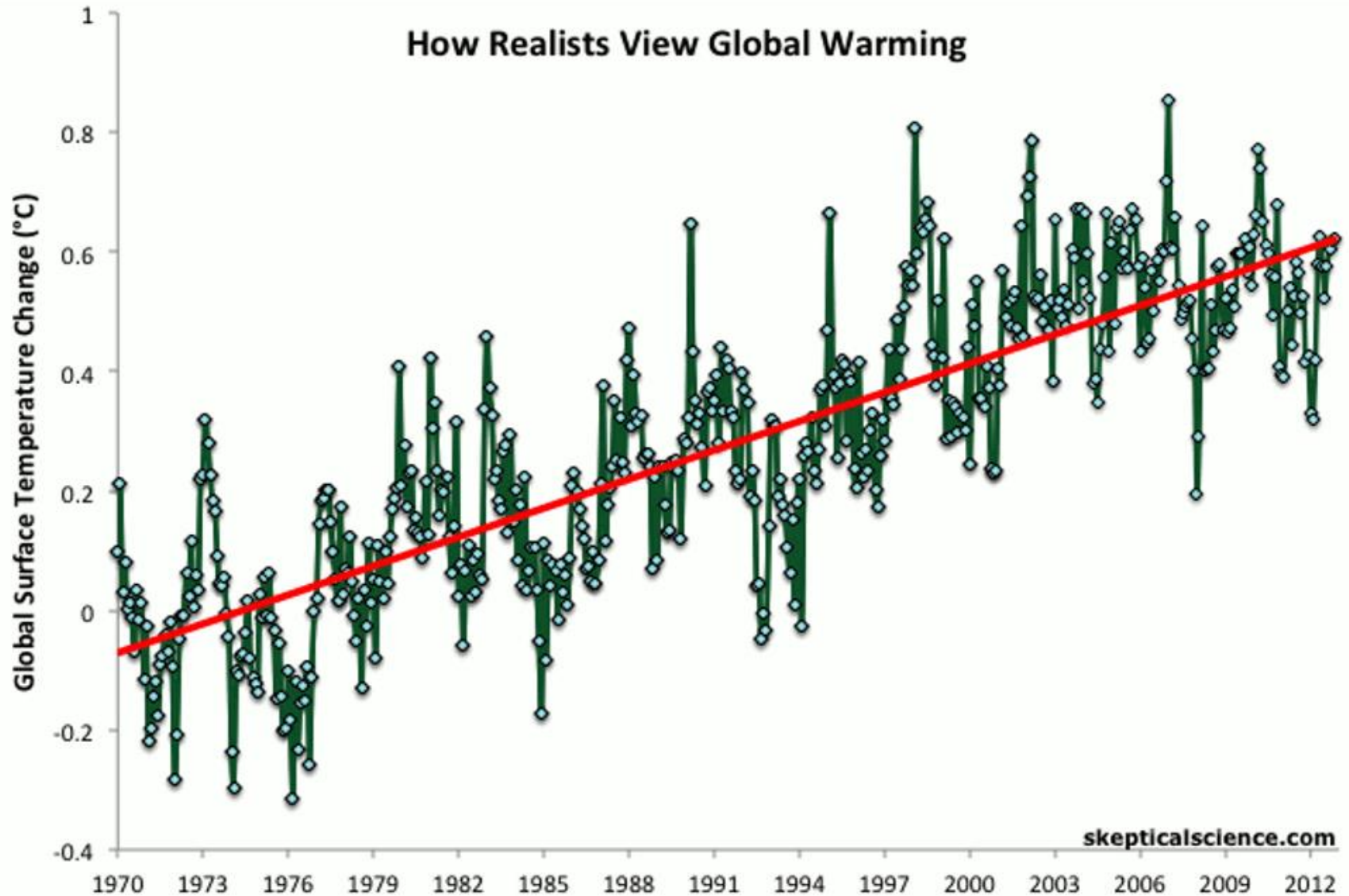
Presentation to AWATEA

May 7, 2015

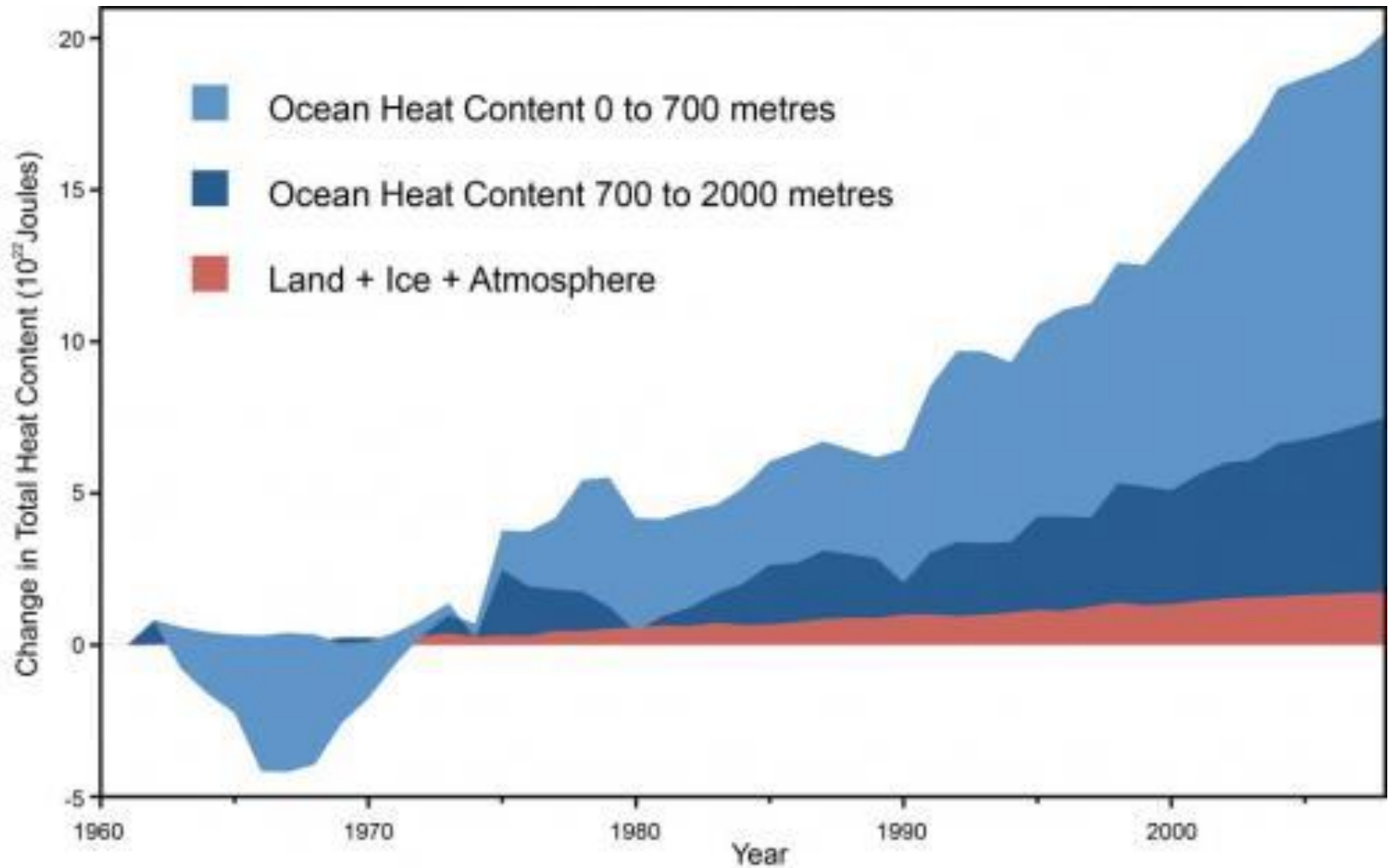
# The climate is changing



# Global temperatures are rising



# Oceans are warming

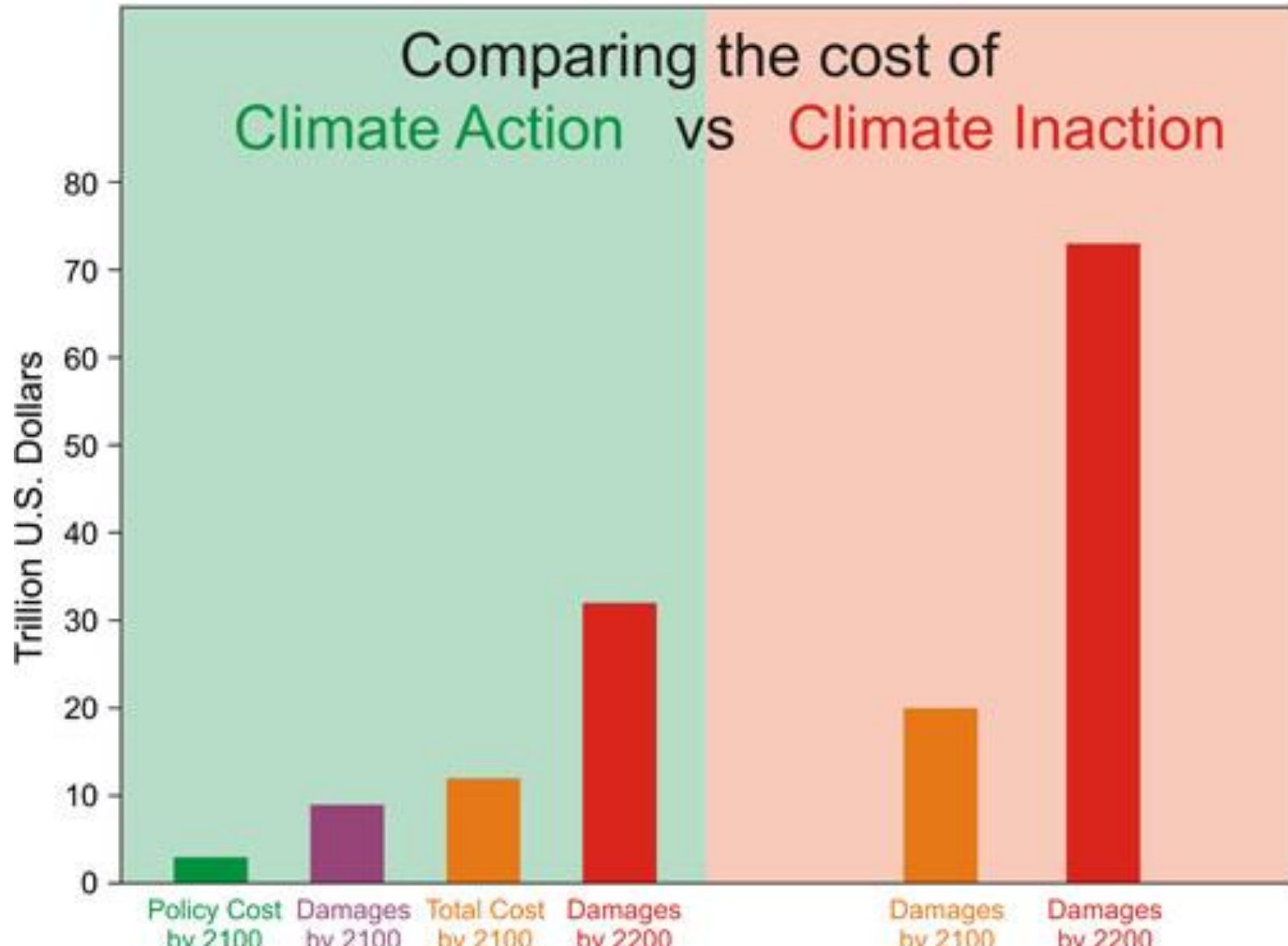


# We are causing it

## How we know we're causing global warming



# It's worth acting



# Climate change mitigation is a global problem



Coordinate across countries

Monitor indicators of effort

- production emissions
- consumption emissions
- fossil fuel production
- % renewables in electricity
- uptake of key new technologies
- public awareness
- research into low emissions alternatives
- contributions to mitigation elsewhere
- carbon price...

# A little history

Before the ETS NZ had tried:

- Carbon tax
- Negotiated Greenhouse Gas agreements
- Projects to Reduce Emissions

and many other smaller programmes

- Biofuels targets
- Insulation programme
- Energy efficiency programmes
- Building standards...



BRRRRP





# Why emissions pricing?

The options for mitigation are many and varied

Understanding the climate implications of any action is really hard

Only private actors really know what can be done and what costs are

Price based instruments can:

- facilitate action by the willing by reducing financial barriers
- provide an incentive to the reluctant to act – or get them to fund other action
- provide accurate signals of the actual GHG cost of different activities



# Why an ETS (emissions price)

1. Create a carbon price
  - Investment signal
  - Enable changes in consumer and producer behaviour
2. Facilitate credible international commitments
  - If target passed into ETS cap commitment is credible
  - NZU price gives signal of local beliefs about real long-term stringency
3. Increase effectiveness of other policies by removing economic barriers
4. Devolve costs of international commitments from taxpayers to emitters

# Basic cap and trade

1. Define cap (tonnes of CO<sub>2</sub>eq per year)



Import and production of fossil fuels

Distribution and retail

trucking

Final Products

Electricity generation

Renewables

Retailer

Stationary Energy

Residential use

Industrial use

Consumers

exports

'Cap'

Other sectors: industrial processes – e.g. cement, steel  
Forestry; agriculture, waste

Transport



# Basic cap and trade

1. Define cap
2. Allocate (sell or give) 'units' that sum to cap
3. Allow trade in units
4. Monitor and enforce

If, for each point of obligation (monitored point)  
emissions  $\leq$  units

then, cap is achieved.

If emissions would have been higher than the cap,  
someone must have mitigated.

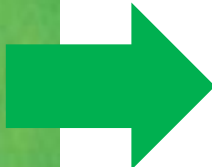
Price rises until the cap is met.



# Measuring emissions

'National Inventory' measures all greenhouse gas emissions and sequestration based on international rules.

Target: 1990 emissions.



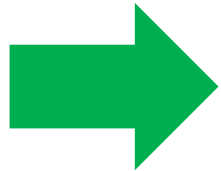
1990 + sequestration + purchased units  
+ units withdrawn from bank  
= 2012 national inventory




# Devolution of obligations

Private actors at point of regulation must:

- Report information to model GHGs from chain of production
- Surrender emission units that match the inferred emissions (units are freely allocated by government or purchased from the carbon market)
- Claim emission units to match sequestration



Emissions = free allocation + purchase



In an all-sources, all-gases system, the total units surrendered will match the national inventory and New Zealand will achieve its international target.



# The New Zealand ETS

Compliance system has been operating since:

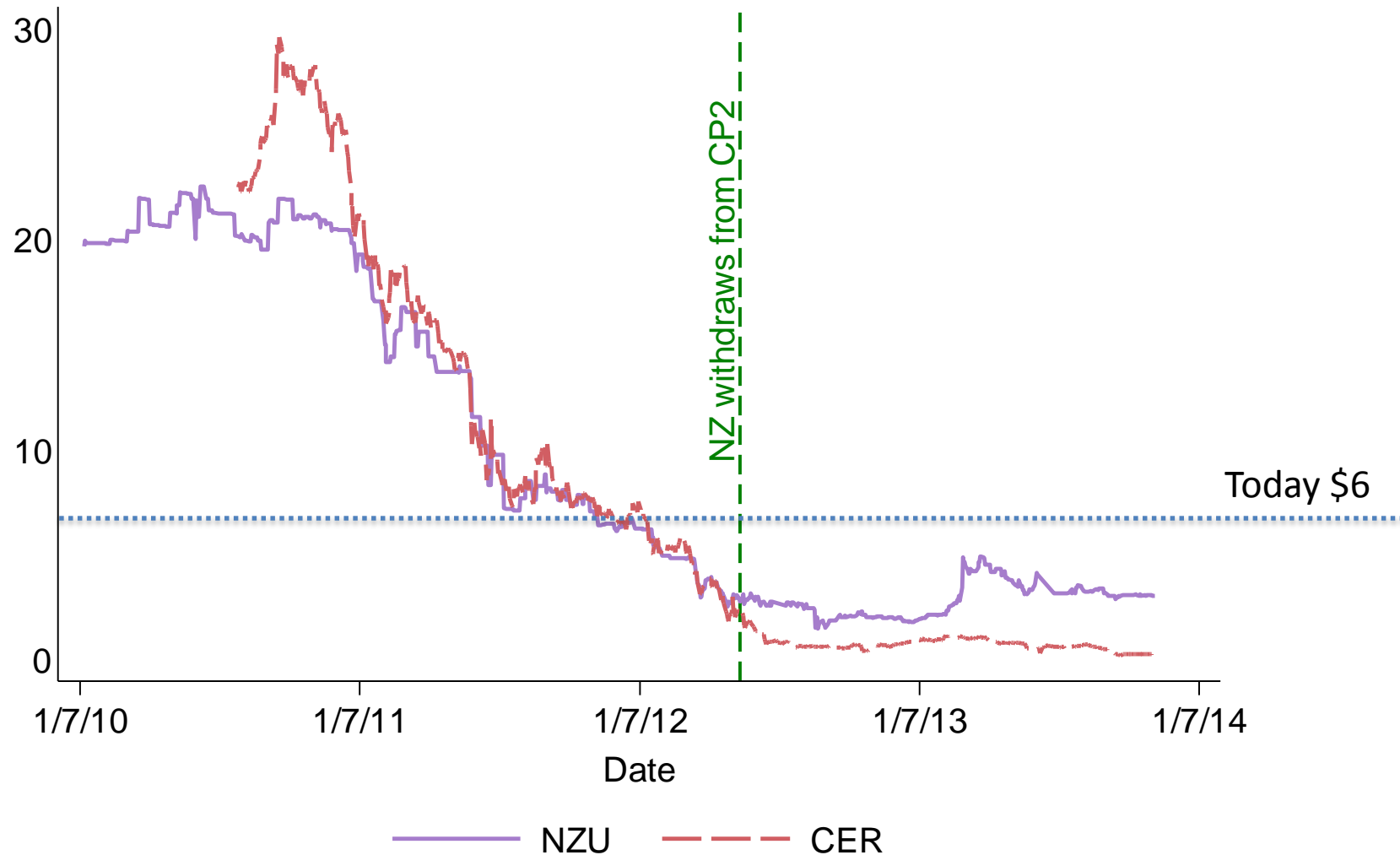
- 2008 forestry
- 2010 liquid fuels, stationary energy and process emissions
- **agriculture?**

Simple system with high credibility of monitoring

Ability to buy units from overseas has been critical



# Emissions prices in NZ



Data Source: OM Financial

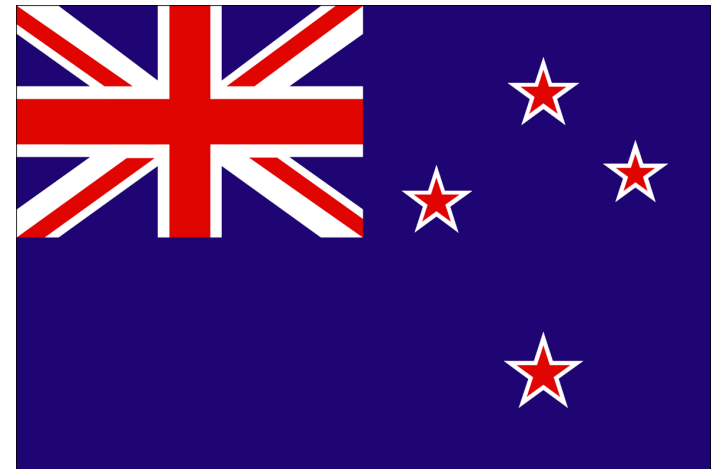
# Kyoto is over: Where now?

New Zealand's system is strong in some ways:

- Comprehensive
- Simple
- Focused allocation strategy

## Key Challenges

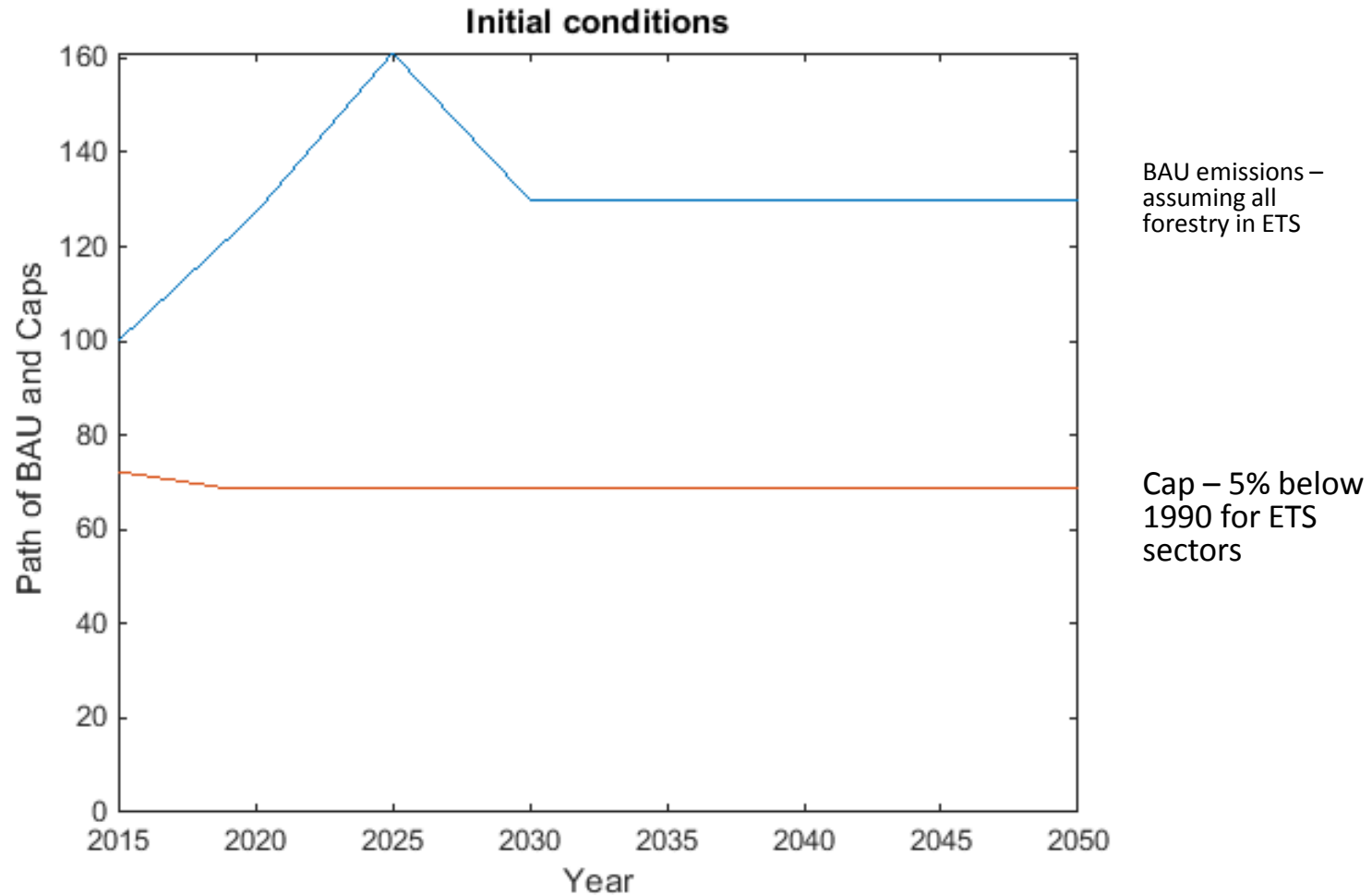
- Recovering from linkage to unreliable international market
- Large 'bank' – 4X annual emissions
- Need to be able to buy units
- Low policy / investment stability
  - Lack of confidence
  - Weak political signals
- **Create strong set of complementary measures**



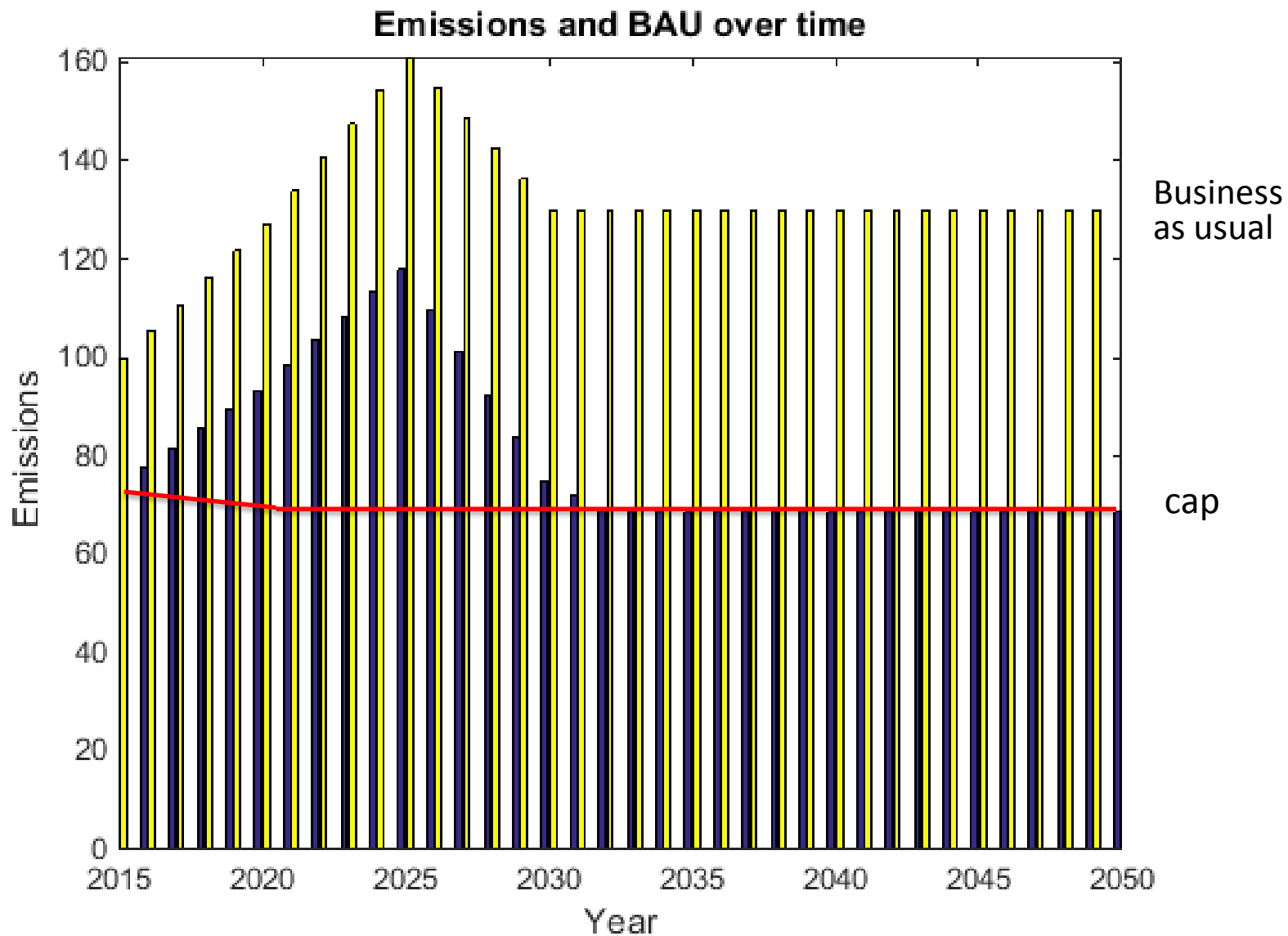
We are not on track to achieve a  
5% reduction in NZ emissions  
relative to 1990 by 2020

# Simple illustrative model: cap

Bank is four times BAU (ETS sectors) in 2015



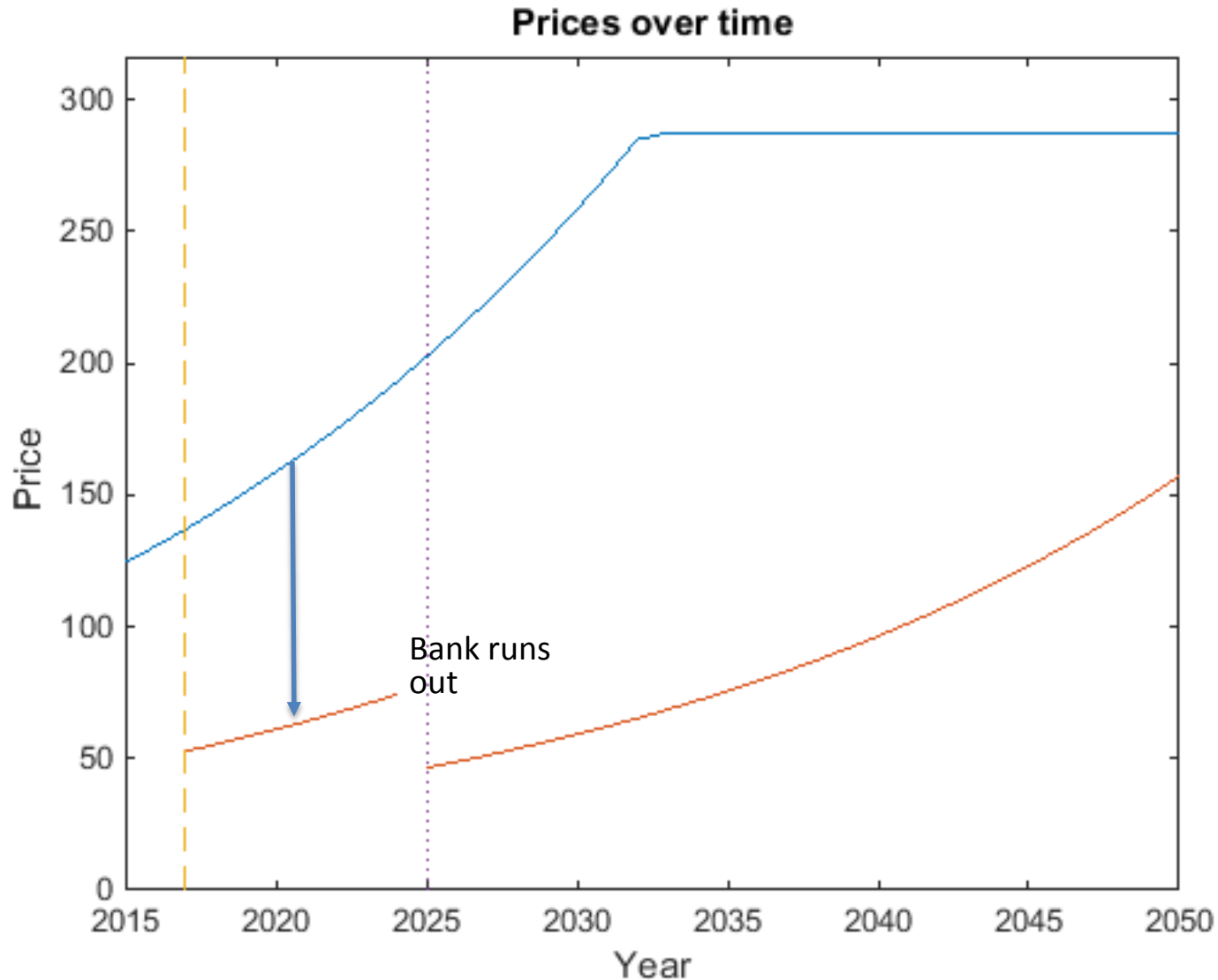
# Emissions with no linking



# Prices in system with no linking – too high!



# What if we think we will be able to buy international units at \$50 from 2025?





# What do we need to do?

- Find a way to buy units from a credible international source
- Get the ETS price up
- Create strong measures to complement the ETS
  - ETS as insurance that we will get there, not primary driver.

# Renewables

1. Ideas
2. Experimentation
3. Learning from early adopters

1 needs government research support.

Why would 2 and 3 happen too slowly?

Need increased electricity demand.

electric vehicles; hydrogen export?

Players are too small relative to market – cooperate or collaborate with large players.

Electricity market barriers

Infrastructure



# 1. Ideas

Where do new ideas come from and how can we identify them faster?

R&D in NZ – important in a few sectors

Ideas from abroad – most ideas imported



## 2. Experimentation

A good idea – but will it work here?

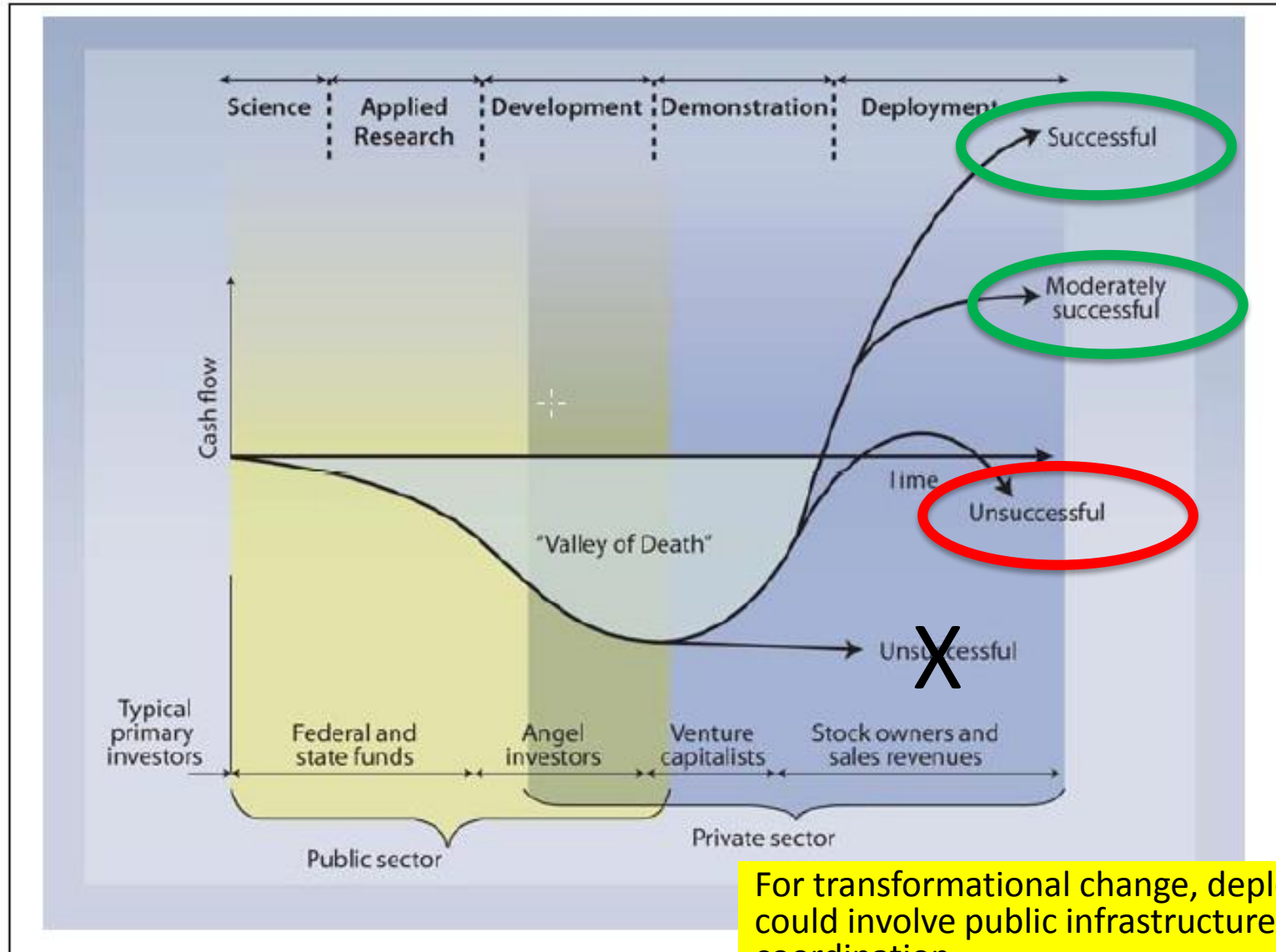
Public benefit  subsidise experiments and evaluate

Avoid 'lock-in': 'hurry up and slow down'

Reward legitimate failure



# Identify unsuccessful fast Promote successful fast



# 3. Learning from early adopters

Idea is now tested and it works.

Market infrastructure needs to develop: production; retail; marketing and distribution; servicing...

Product needs to be refined in use

Users need to learn about the product

These processes are slow and risky

Subsidise early adopters (firms and users) to compensate for the 'learning externality' they provide society

Evaluate experience of early adopters



# Conclusions

We need to transition to very low emissions - soon

A carbon price can help with that transition and we already have that architecture in place (though needing improvement)

Carbon prices can't do it alone

Renewable technology will be more profitable with a high carbon price – but carbon prices are risky and the price is not the only problem

Fund basic research – public benefits from knowledge – high risk

Subsidise experimentation and evaluation

Subsidise early adopters – ‘learning externality’

