



# Pathways to New Zealand's Low-Emission Future

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# Topics

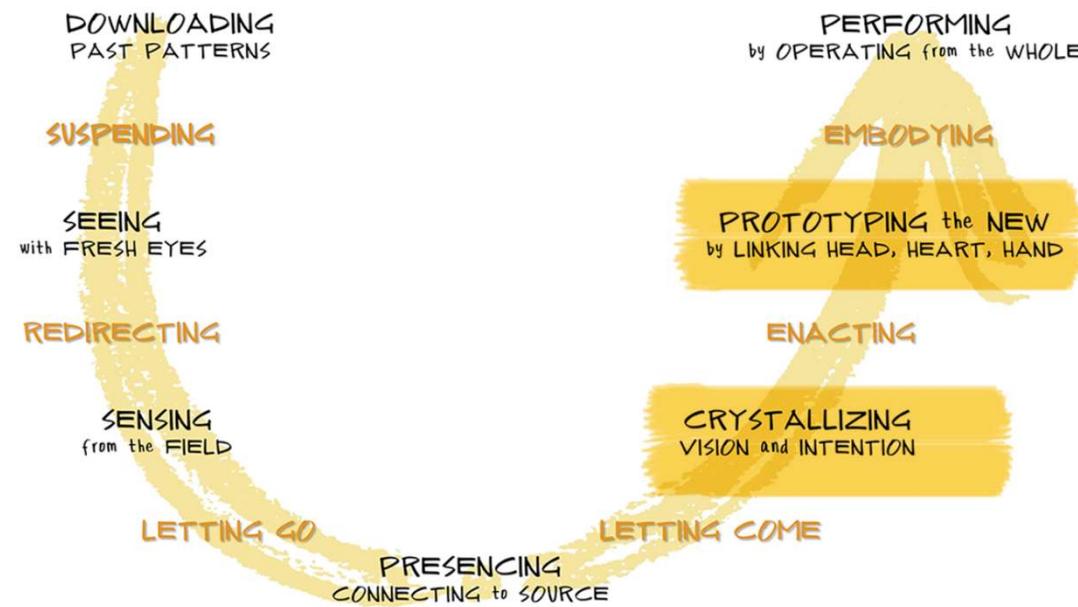
1. Background on the LEF Dialogue
2. Current policy framework
3. Forging a new climate change narrative
4. Exploring pathways to net zero emissions
5. Key messages

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*Disclaimer: This presentation does not necessarily reflect the views of or endorsement by Low-Emission Future Dialogue participants, their organisations, or programme funders.*

# Dialogue overview

- 20 participants: government, business, NGO and academia
- Personal capacity, Chatham House rule
- “Theory U” process developed by Otto Scharmer and colleagues at MIT





# Current climate policy framework

Past objective: Least-cost compliance with modest international responsibility targets

= *Incremental change*

New context: Joining global decarbonisation

= *Transformational change*

# Climate narratives: A tale of two countries

## The old story:

NZ will do its bit on climate change, neither leading nor lagging. We're too small to make a difference, and given our agriculture sector, high renewable generation and NZ ETS, there's not much more we can do anyway for now.

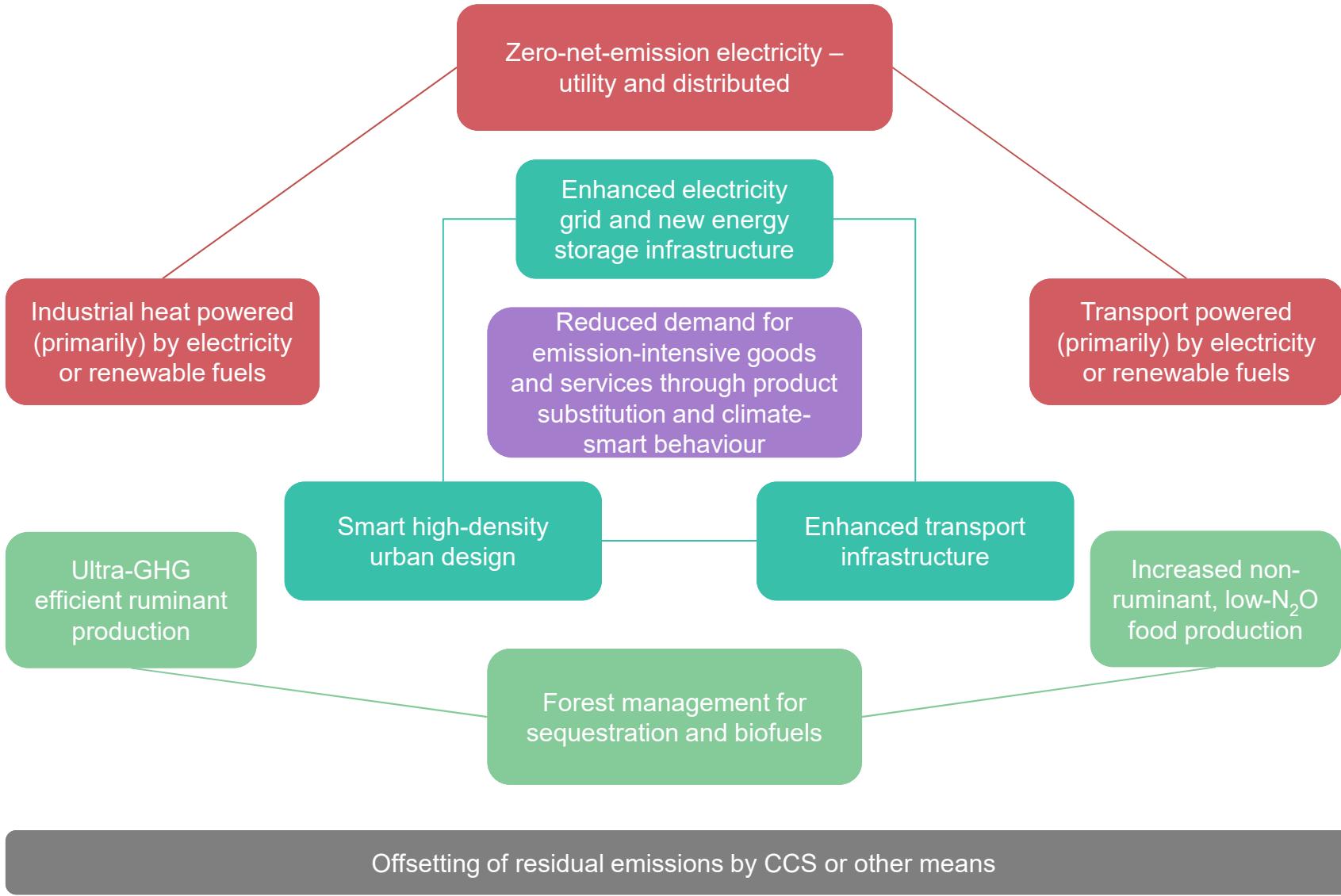


## A new story:

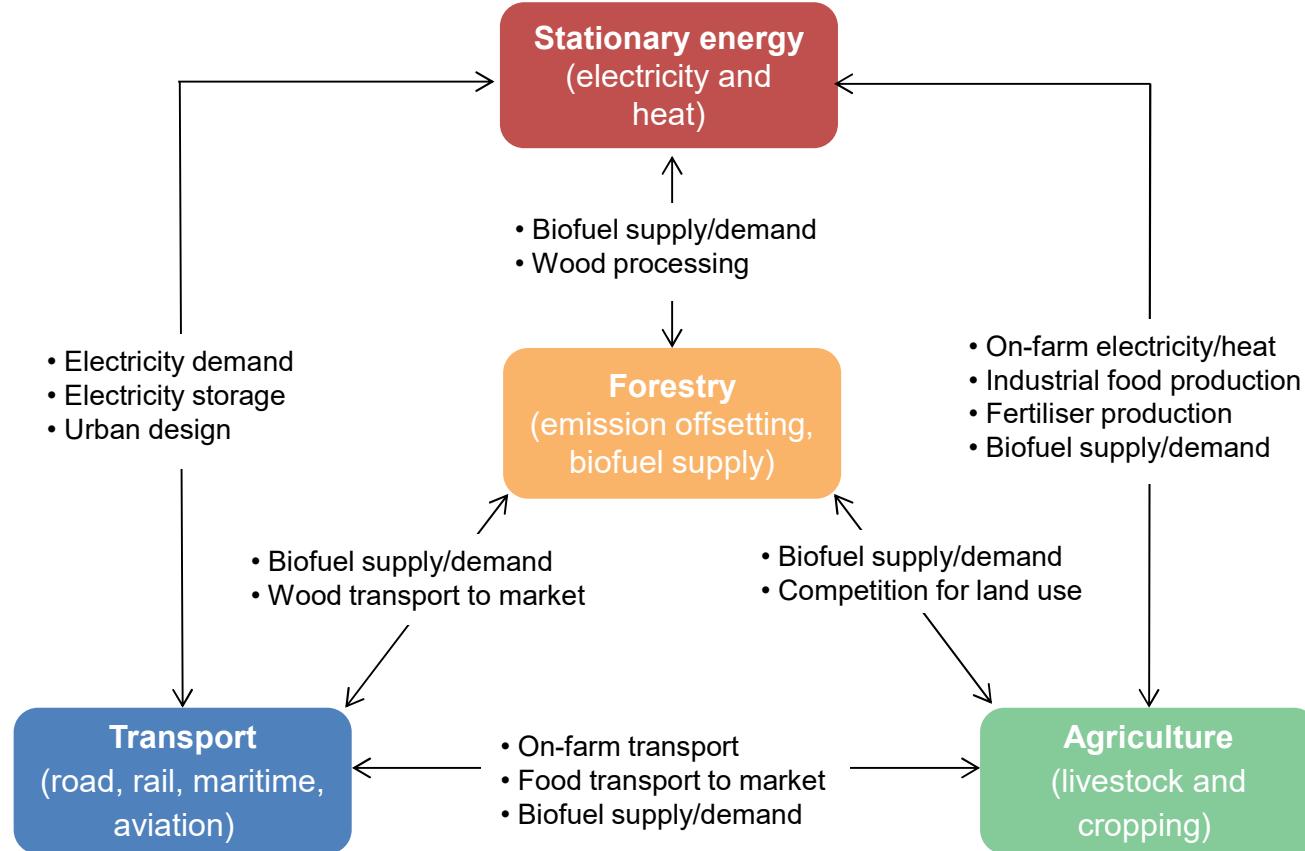
New Zealand is responding to climate change with smart solutions that safeguard our future, enable a thriving low-emission economy, create new opportunities for our communities, and can be shared with other countries.

We are accelerating this transition by decarbonising our stationary energy and transport sectors, improving energy efficiency, making our agricultural production ultra-efficient, enhancing forest sinks, and strengthening partnerships across sectors.

# Driving a zero-net-emissions future



# 2050 pathway linkages



# Possible sector characteristics

## Stationary energy

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

1. Utilities supply (nearly) 100% renewable generation.
2. Distributed renewable generation displaces (some) utility generation.
3. Heat for industrial production and buildings (primarily) is produced with renewable electricity or other non-fossil fuels.
4. Emissions from fossil fuel or biomass combustion are removed by carbon capture and storage.
5. Disruptive technology transforms supply of power and/or heat.
6. *Enhanced energy efficiency and energy conservation generate multiple benefits.*
7. *Disruptive technology transforms demand for power and/or heat.*

# Possible sector characteristics

## Transport

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

1. Transport is powered (primarily) by electricity.
2. Transport is powered (primarily) by biofuel.
3. Disruptive technology transforms transport energy supply.
4. *Vehicle fuel efficiency increases significantly.*
5. *Private motor vehicle use is heavily displaced by public, other shared or active transport modes.*
6. *Private motor vehicle use is significantly reduced by urban planning and/or culture change.*
7. *Freight mode shifts significantly from road to rail and shipping.*
8. *Freight transport demand declines significantly due to changes in technology or consumer demand.*



# Pivot points: Stationary energy

1. Major gas field discovery
2. Certainty over Tiwai Point aluminium smelter
3. Development of affordable grid-scale battery storage technology
4. Development of lower-cost renewable generation that displaces hydro, allowing hydro to serve as the “battery”
5. Rapid uptake of affordable distributed renewable generation
6. Optimisation of electricity network with effective smart grid
7. Introduction of commercially viable carbon capture and storage
8. Technology breakthrough in stationary energy generation
9. Technology breakthrough in renewable industrial heat
10. Fundamental process changes in industrial production
11. Increased energy demand due to climate change
12. Social commitment to end energy poverty



# Pivot points: Transport

1. Accelerated transition to EVs by vehicle producers
2. Technology breakthrough for commercial biofuel production from woody biomass
3. Other disruptive transport technology
4. Significant and sustained changes in the price of oil (upward or downward)
5. Major investment in the Auckland transport network
6. Rail decommissioning, electrification or sale to private operators
7. Lithium shortage/crisis affects EV battery technologies
8. Major changes to international shipping supply/demand/cost
9. Change in social norms for vehicle ownership
10. Broadband uptake



# Key messages

1. Our destination is domestic decarbonisation, and any number of pathways could take us there.
2. An adaptive approach is supported by:
  - a. Building our capacity
  - b. Enabling experimentation
  - c. Leaving desirable options open
  - d. Avoiding lock-in to high-emission pathways.
3. Transformational change will require more than a low and blunt carbon price. NZ ETS reform is only part of the solution.
4. We need new opportunities for engagement between government, businesses, researchers and civil society on New Zealand's low-emission development strategy.

# Final thought



**Through focused intent  
Even small countries can be  
Forces for great change**