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# Land use implications of a Net Zero New Zealand

**9th August 2017**

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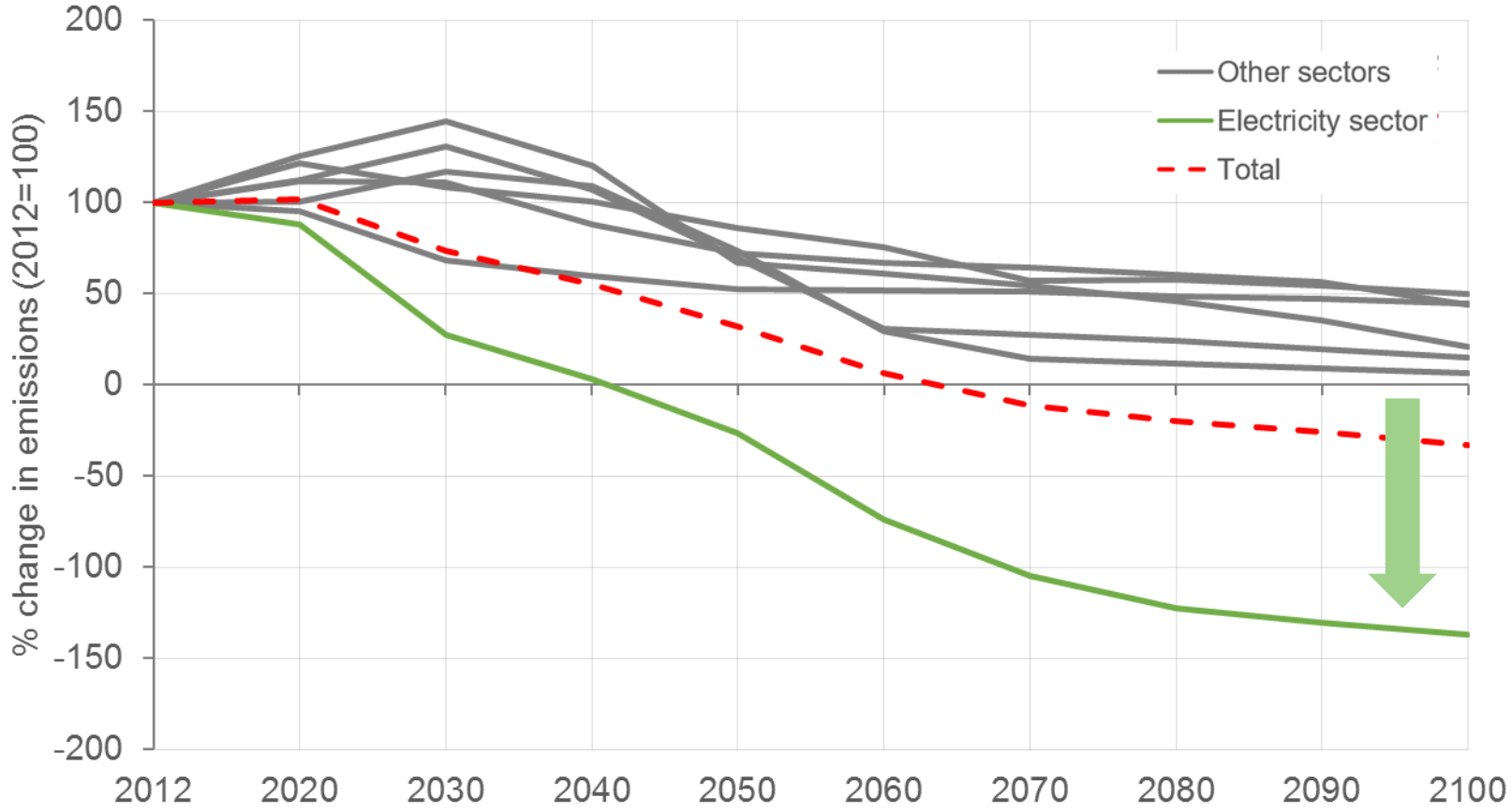
# The 2 degree goal is achieved by balancing emissions sources and sinks – the Net Zero goal - in the second half of the century

## NEGATIVE EMISSIONS ARE REQUIRED TO MEET 2 DEGREES

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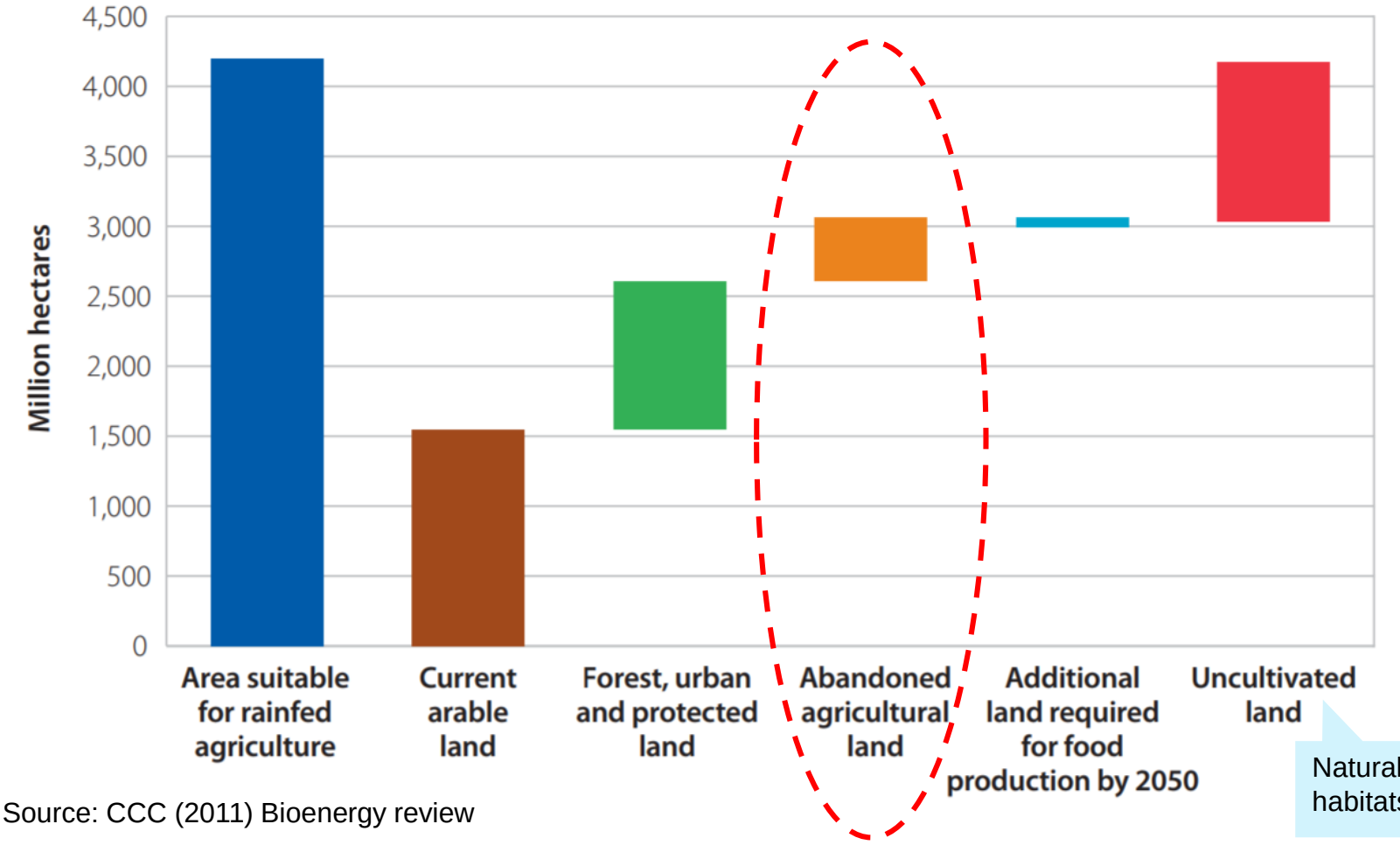
# Net Zero is a challenge for global land use patterns: bioenergy creates competition for land between food and fuel

## THE LAND AREA AVAILABLE FOR BIOENERGY IS LIMITED IN 2050




Source: CCC (2011) Bioenergy review

# Net Zero is an opportunity for the land: emission reductions from agriculture reduce the global cost of meeting climate targets

at a global level, the total cost of stabilizing temperature to 2.5 degrees warming fall by over 60% if non-$CO_2$ mitigation options are included. Many options are in the agriculture sector:

— feed changes

— precision farming

— improved timing of fertilizer application

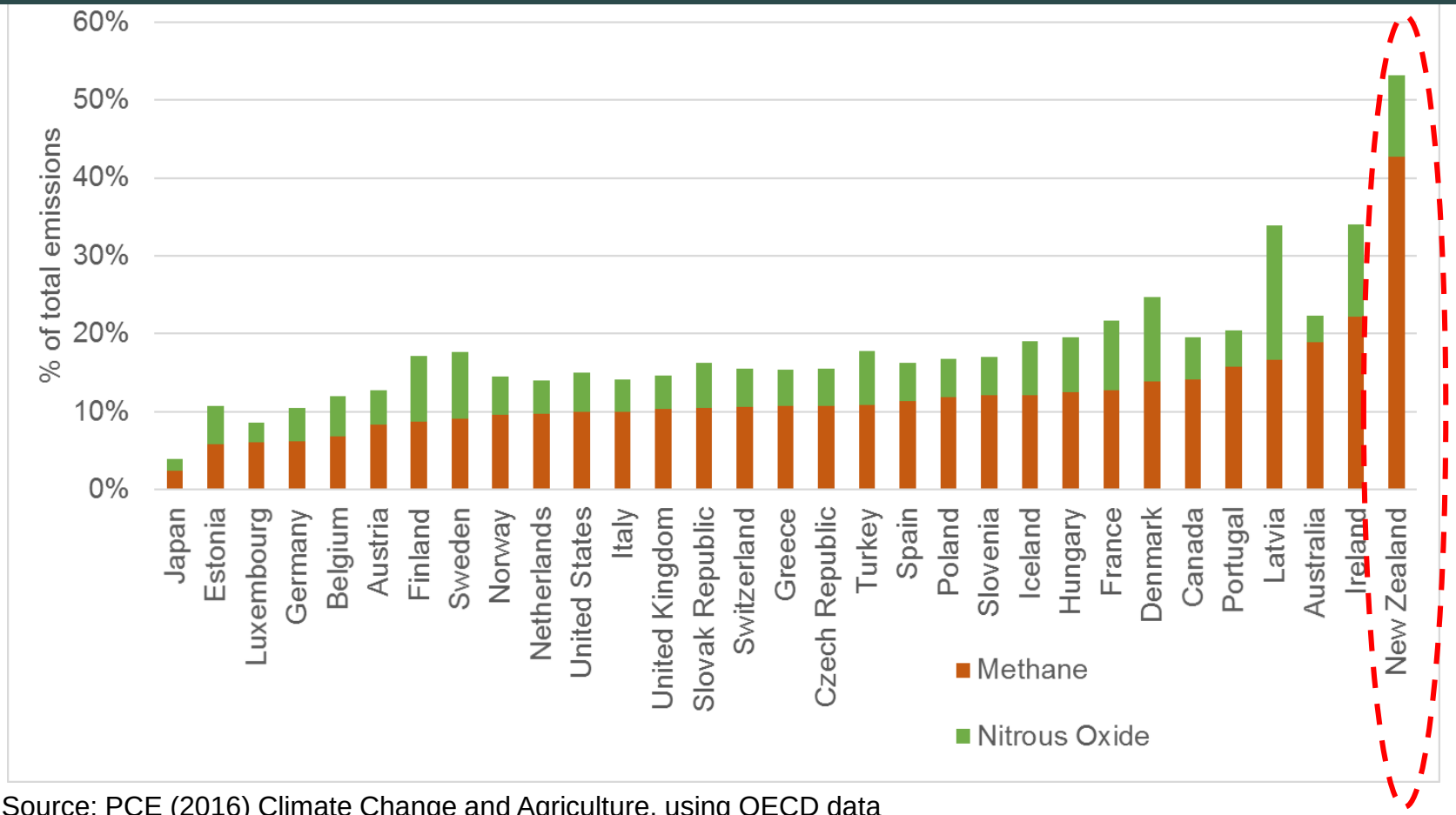
— nitrification inhibitors

further potential for reduction on the demand side, where worldwide adoption of the *Harvard healthy diet* could reduce mitigation costs for energy by more than 50 per cent

Source: Gambhir et al. (2017) The Contribution of Non-CO2 Greenhouse Gas Mitigation to Achieving Long-Term Temperature Goals; Stehfest et al. (2009), 'Climate Benefits of Changing Diet', Climatic Change, 95, pp. 83–102.

# The challenges and opportunities on the land are very relevant to New Zealand

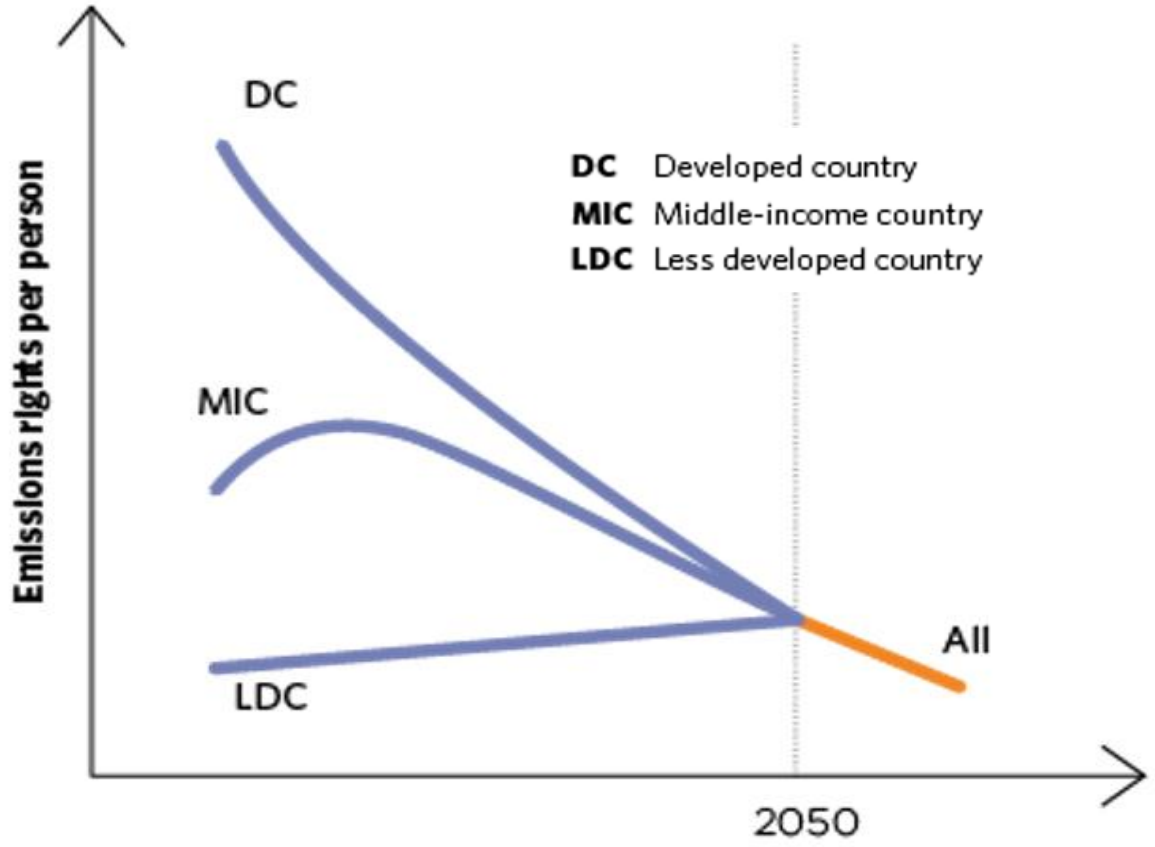
## NON-$CO_2$ EMISSIONS (PRIMARILY FROM LIVESTOCK) AS A SHARE OF TOTAL EMISSIONS




Source: PCE (2016) Climate Change and Agriculture, using OECD data

# As a developed country, New Zealand is unlikely to be a candidate for special treatment

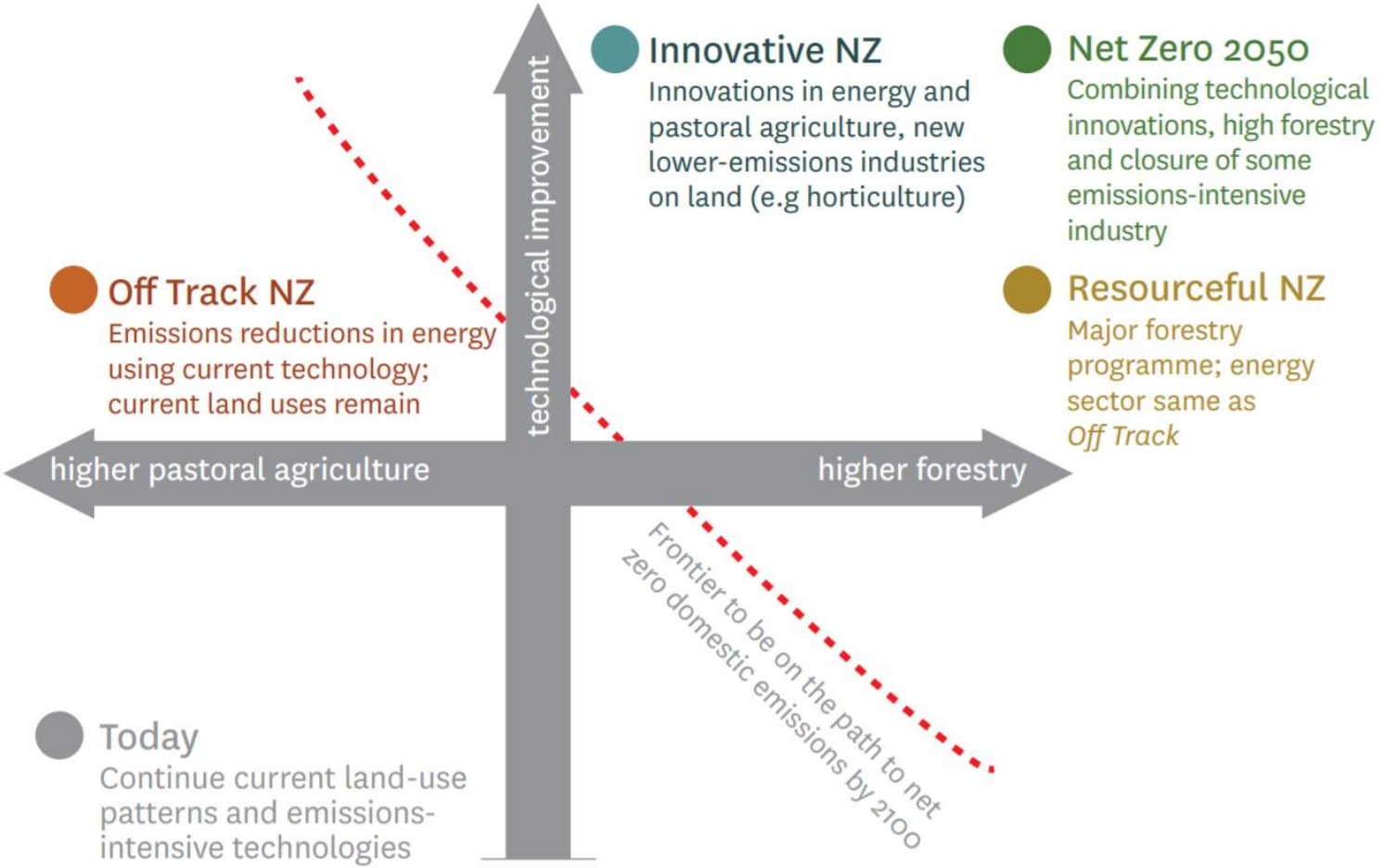
## ANY SCOPE FOR EMISSIONS GROWTH IS ALLOCATED TO DEVELOPING COUNTRIES




Source: Climate Change Authority based on Höhne and Moltmann 2009

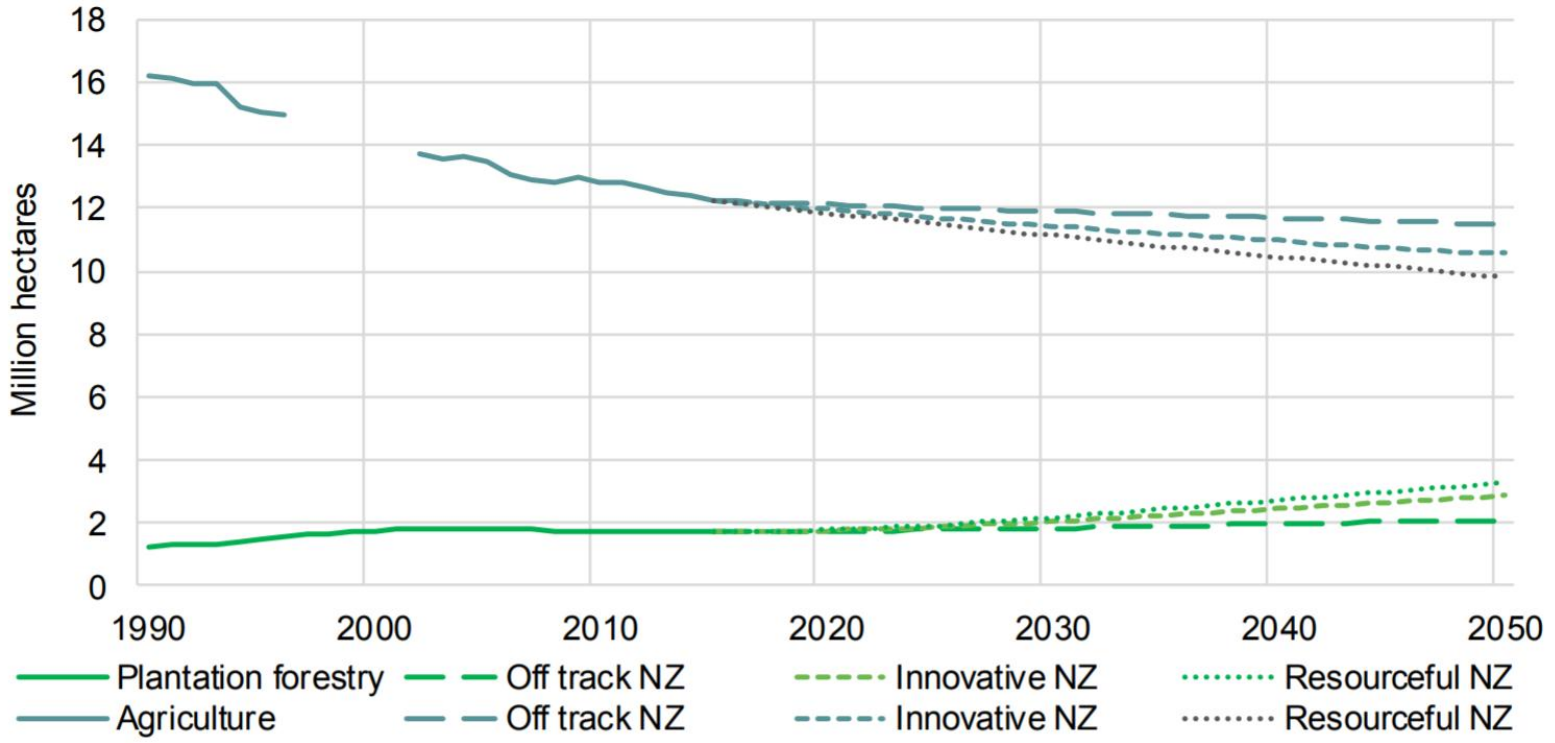
# It is possible for New Zealand to move onto a pathway consistent with net-zero emissions, but only if it alters its land-use patterns

## NET ZERO EMISSIONS SCENARIOS FOR NEW ZEALAND



# While the required shifts are significant, so are those of recent history

## HISTORICAL LAND USE CHANGE SINCE 1990, AND PROJECTED CHANGE TO 2050



# New Zealand is better prepared to manage the transition than almost any other emissions intensive exporter

it is already more diversified than many other emissions intensive exporters

— export revenues of dairy, meat and wool account for <10% of GDP,

— Kuwait, Saudi Arabia, Qatar and Kazakhstan revenues from exports of fossil fuels are >50%

economic history shows that the ability to adjust rapidly in the face of structural change is driven by economic fundamentals such as:

— human capital

— knowledge capital

— infrastructure

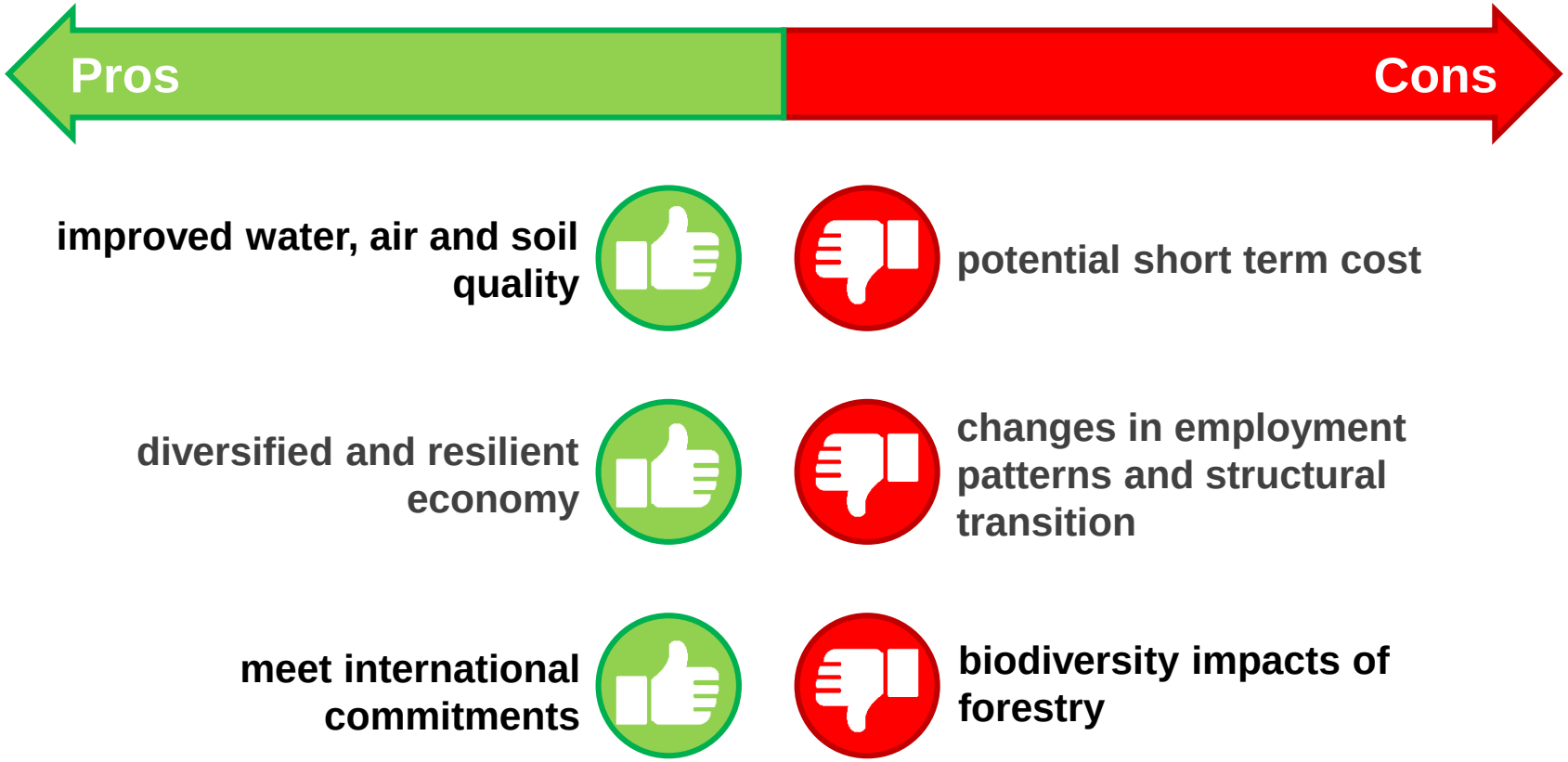
— institutional quality and governance

— macroeconomic stability

— openness to technology

on all these NZ is superior to almost all emissions dependent exporters (except maybe Norway)

# A national conversation can help navigate difficult trade offs associated with land use change



# Where to from here?

- global political agreement is vital, and the stepping back of the US has led to the stepping forward of China and the EU
- this is particularly important for agriculture, as a globally traded commodity
- NZ agriculture also faces risks: greater climate variability, potential disruption from meat and dairy substitutes, international competition from intensive agricultural systems
- these are challenges that are difficult to address when there is political disagreement on the overarching direction of policy
- striking transitions are already taking place around the world with the help of political consensus that lead to maintained support over time

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