

: vivideconomics

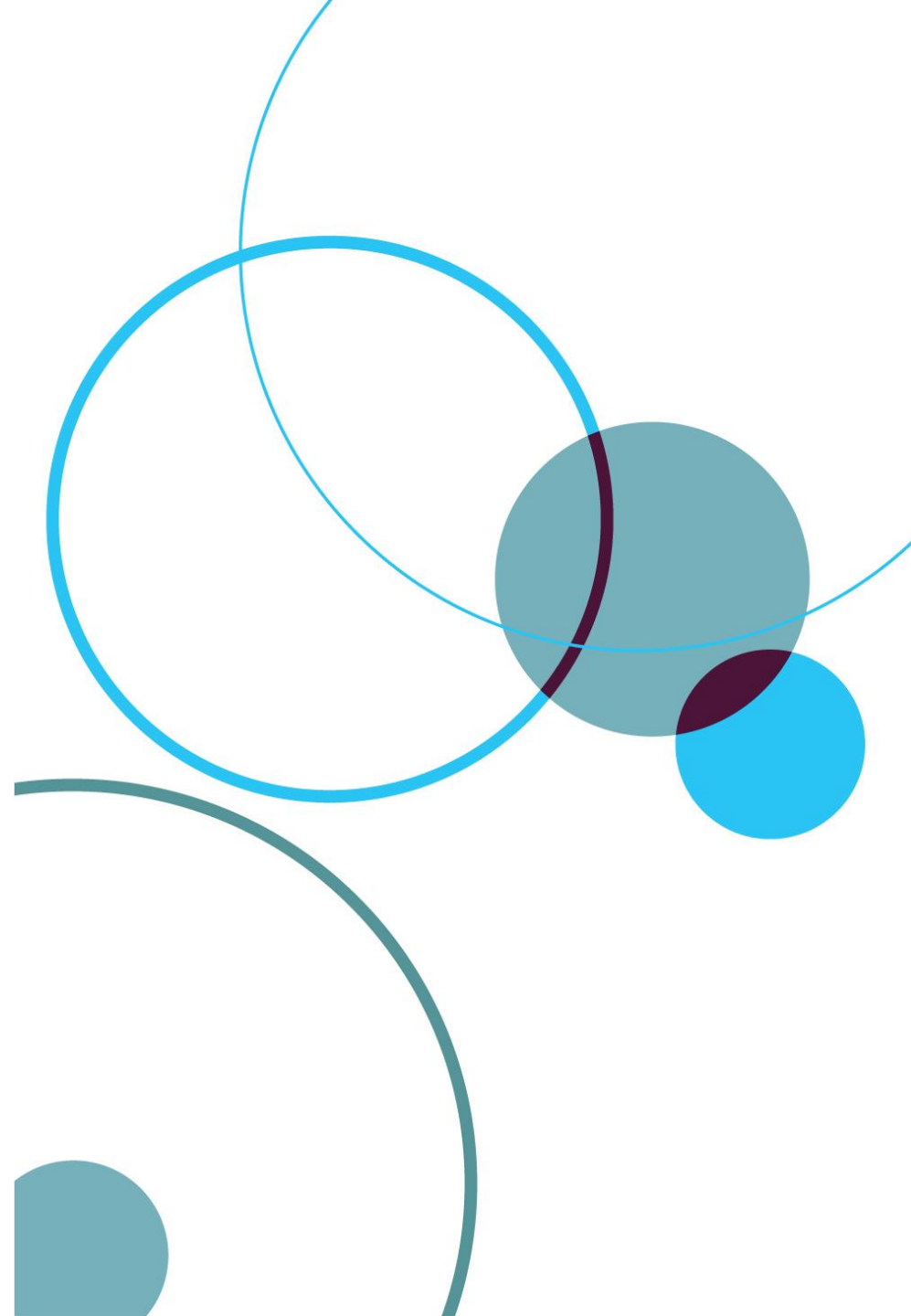
# Net Zero in New Zealand

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**Scenarios to achieve domestic emissions neutrality in the second half of the century**

Prepared for GLOBE-NZ

20<sup>th</sup> March 2017



## The study has three objectives

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### Evidence

To build a shared understanding of the available data and evidence on abatement, costs and co-benefits associated with reducing emissions in New Zealand, as well as the priorities for new research.

### Pathways

To construct an indicative understanding of alternative 2050 scenarios for New Zealand's transformation towards a low-emission economy.

### Strategic implications

To identify strategic implications, key decisions and challenges faced by New Zealand, including barriers to the attainment of abatement in each sector of the New Zealand economy (recognising that much more detailed policy elaboration will be required in future)

The study has a defined scope (1 of 2)

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**informed by Paris Agreement goals:** *'holding the increase in global average temperature to well below 2°C ...[and] ...to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century'*

**extent of global action.** assume that all countries are on a pathway that is broadly consistent with 2 degrees

**pathways set out to 2050 (and indicatively to 2100):** but not all reduce to same level

The study has a defined scope (2 of 2)

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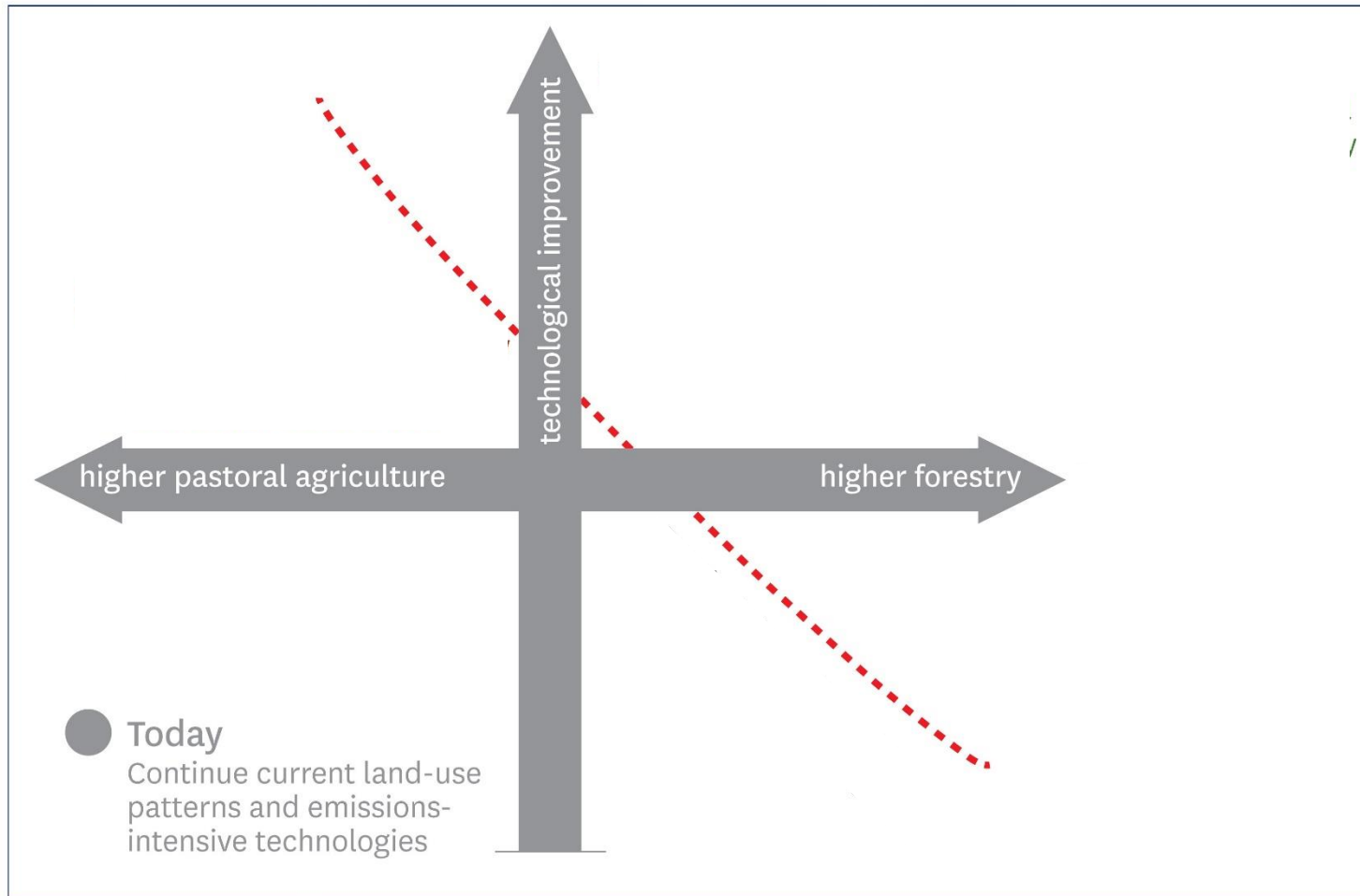
**the analysis intends to focus on domestic opportunities.** questions regarding New Zealand's global responsibility – and hence use of international carbon markets – are not included

**no new evidence** our assessment is limited to what is publicly available

**international aviation and shipping are not included**

**independent findings** and its contents will not necessarily reflect the views of the members of the Joint Project Committee, Globe-NZ or any other entity

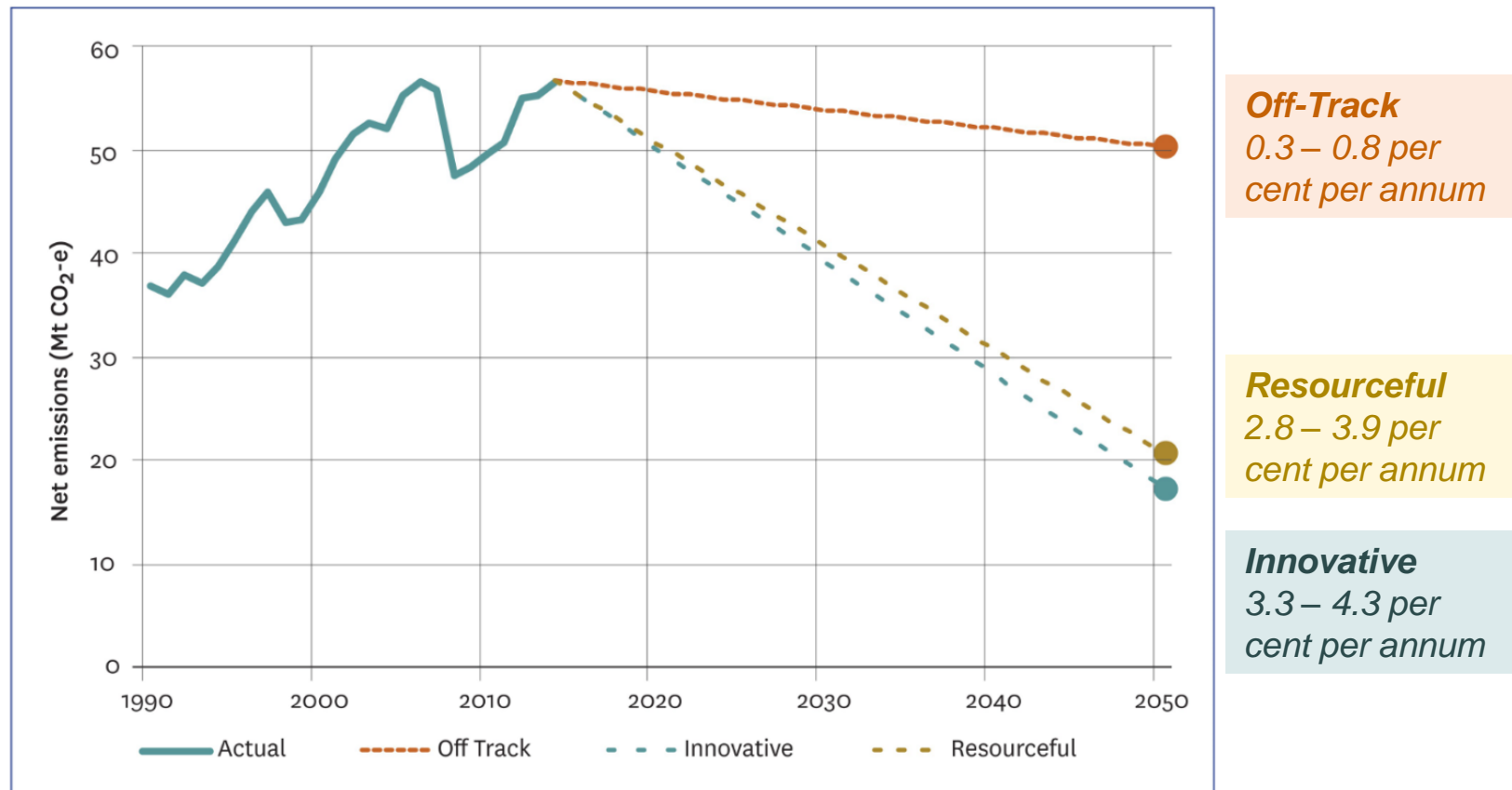
# Our scenarios vary by the adoption of low-emissions technologies and patterns of land use



## The different scenarios imply very different economic structures for New Zealand ...

	2014	Off Track 2050	Innovative 2050	Resourceful 2050
Total electricity (GWh)	39,206	70,926	83,414	71,347
% of renewables in generation mix	80%	91%	98%	91%
Waste per capita (kg)	735	620	504	620
No of dairy cattle	6.7	6.7	5.4	6.0
No of beef cattle	3.7	3.7	2.6	3.0
No of sheep	29.8	29.8	19.7	22.5
Average new planting rate exotics (ha per year)	n/a	9300	27,709	37,936

## ...and have very different emissions implications



Emission reductions are reported on a net-to-net basis, compared to 2014 – the most recent data for emissions – as this represents, in the authors' view, the most transparent and easy-to-understand metric for assessing the extent of change from 2014 emissions and progress towards a net zero goal.

## The scenario analysis provides 5 important insights

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1. All pathways include a move towards a 100 per cent renewables grid and substantial electrification of the passenger vehicle fleet and low-grade heat.
2. It is possible for New Zealand to move onto a pathway consistent with domestic net zero emissions in the second half of the century, but only if it alters its land-use patterns.
3. There is a choice between the extent to which it is able to make use of new technologies and the extent to which it needs to embark upon substantial afforestation. With some constraints, there will be an opportunity to flexibly adjust the rate of afforestation as the pace of new technological development and deployment becomes clearer.



## The scenario analysis provides 5 important insights

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4. If it chooses to substantially afforest and it is fortunate enough to benefit from the extensive availability of new technologies, it could be possible for the country to achieve domestic net zero emissions by 2050.
5. Although afforestation will likely be an important element of any strategy to move to a net zero emissions trajectory in the period to 2050, in the second half of the century alternative strategies will be needed.

## From which we derive 9 policy recommendations (1 of 3)

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1. The New Zealand government should develop a trajectory for emissions price policy values consistent with the objectives of the Paris Agreement.
2. A robust, predictable emissions price is vital in encouraging the private sector to make investments consistent with a low-emissions future. In scenarios that envisage substantial land-use change, the extension of the emission price to biological emissions can facilitate land use decisions that take account of the emission implications of that use
3. The emissions price needs to be accompanied by changed market and regulatory arrangements, infrastructure deployment mechanisms, and specific support to address a range of additional barriers and market failures.

## From which we derive 9 policy recommendations (2 of 3)

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4. New Zealand might contribute further to global low emission R&D efforts , particularly in areas where it offers comparatively strong expertise, advantages and needs. Options for collaborative research and experimentation across government, business and research institutions should be explored.
5. Political parties should actively seek to identify and articulate areas of common agreement on climate policy in order to enhance policy coherence and predictability, while allowing room for an informed debate and party difference over policy design
6. Independent institutions, backed by statute, can help assist both the Parliament and government in developing coherent national climate policy, and enhance informed citizen engagement.

## From which we derive 9 policy recommendations (3 of 3)

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7. Policy-making should adopt a holistic approach, including both economic and cultural interests. All stakeholder groups should be taken account of in policy design, including a process of meaningful consultation with iwi and hapū, as per the Treaty of Waitangi's principle of partnership, to acknowledge their interests and aspirations.
8. There is a need to upgrade the evidence base to support New Zealand's low-emissions pathway planning. The most acute need is for one or a series of energy- and land-system modelling tool(s) that generate bottom-up estimates of abatement opportunities and costs, and that take account of the interactions between sectors.
9. A particularly important area for further research and policy development is understanding and addressing the distributional implications of differing low-emissions scenarios, and the policy responses that might help alleviate any concerns

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**Company Profile**

Vivid Economics is a leading strategic economics consultancy with global reach. We strive to create lasting value for our clients, both in government and the private sector, and for society at large.

We are a premier consultant in the policy-commerce interface and resource and environment-intensive sectors, where we advise on the most critical and complex policy and commercial questions facing clients around the world. The success we bring to our clients reflects a strong partnership culture, solid foundation of skills and analytical assets, and close cooperation with a large network of contacts across key organisations.

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