# Making our Future

*Creating a deeply sustainable Aoteroa by 2050*

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**Rod Oram's presentation to the University of Auckland Energy Summer School Auckland, February 20th, 2018**

# The landmines in Jacinda's next 1,000 days

By Bernard Hickey | 12:24pm 5 February 2018

Jacinda Ardern and Winston Peters. Photo by Lynn Grieveson

***Jacinda Ardern's Labour Government did better than expected in its first 100 days. Bernard Hickey looks ahead to the bigger tests in the next 1,000 days before the 2020 election.***

# NEWS

POLITICS

## Waitangi a triumph, but challenges ahead

Everything Jacinda Ardern could control went well, everything left to chance fell her way - but the bar will be higher next time.

Sam Sachdeva | 3 hours ago

POLITICS

## Liam Hehir: The case for 'party hopping'

New Zealand voters, not party leaders, should punish MPs for any defections, argues Liam Hehir.

Liam Hehir | 3 hours ago

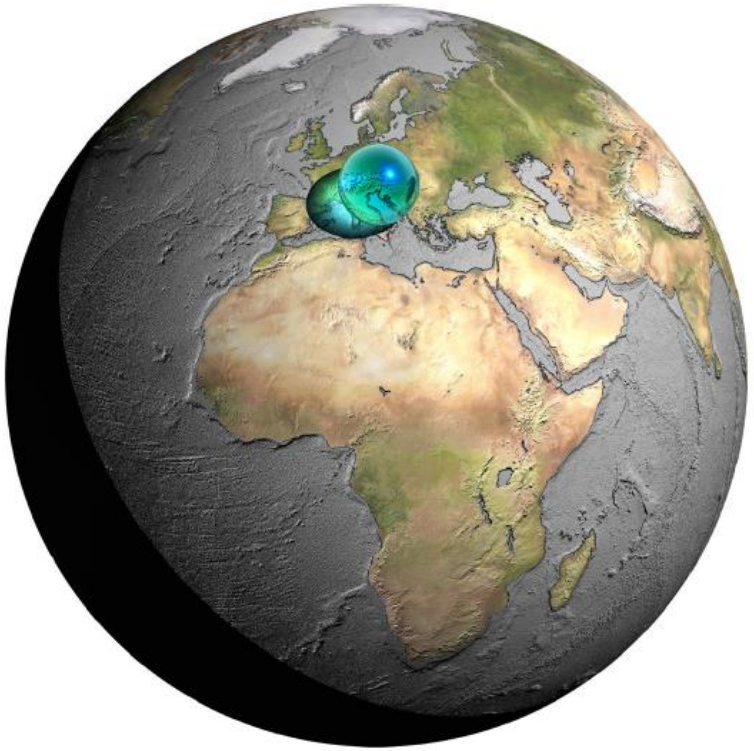



# Agenda

- Home
- Reinvention
- Aotearoa

# Our home

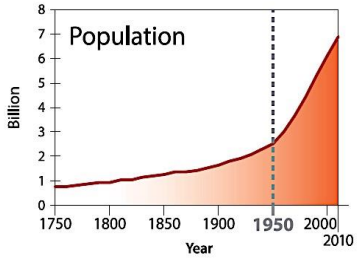
- Dr Adam Nieman www.adamnieman.co.uk
- All water: 1,390 km diameter (All fresh surface water: 62 km)
- All air: 1,999 km across

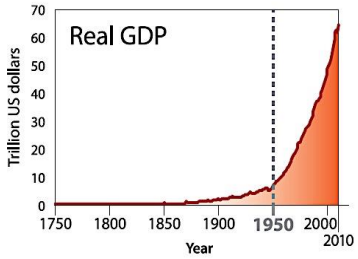


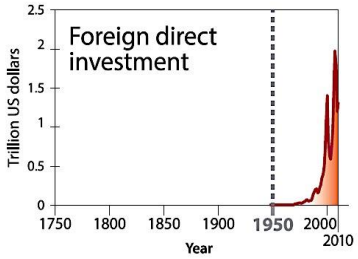
All the water in the world (1.4087 billion cubic kilometres of it) including sea water, ice, lakes, rivers, ground water, clouds, etc. Shown on the same scale as the Earth.

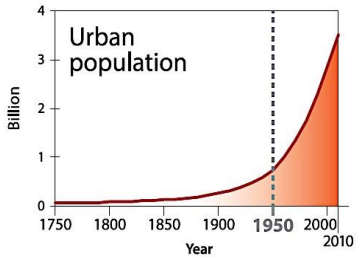
All the air in the atmosphere (5140 trillion tonnes of it) gathered into a ball at sea-level density. Shown on the same scale as the Earth.

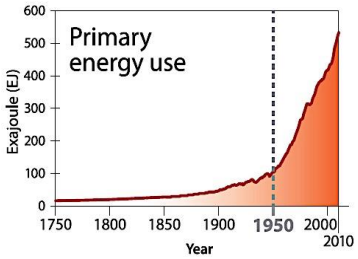
# Socio-economic trends

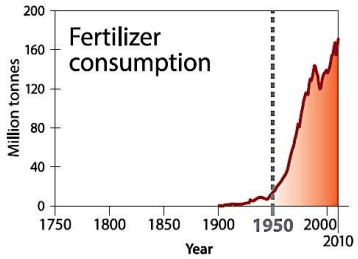


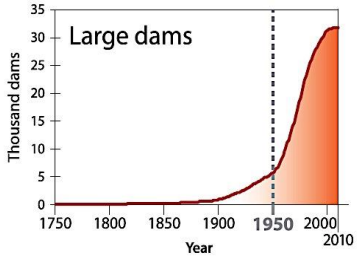



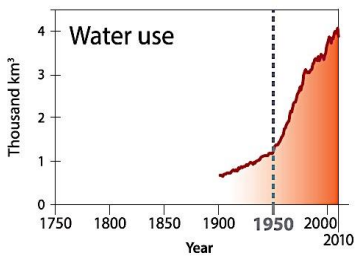



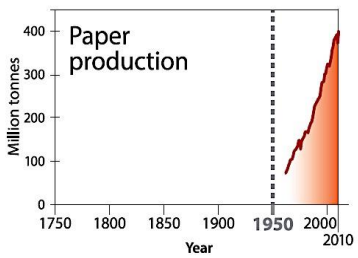



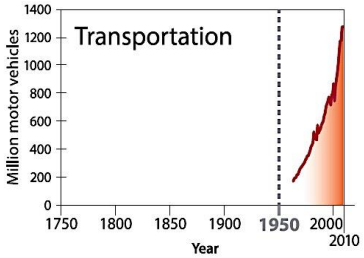



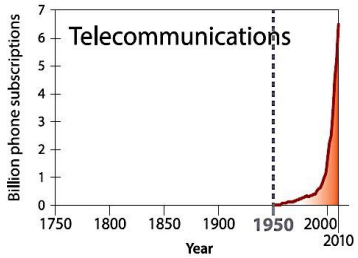



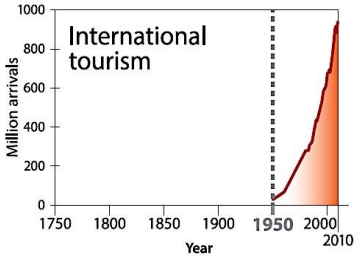



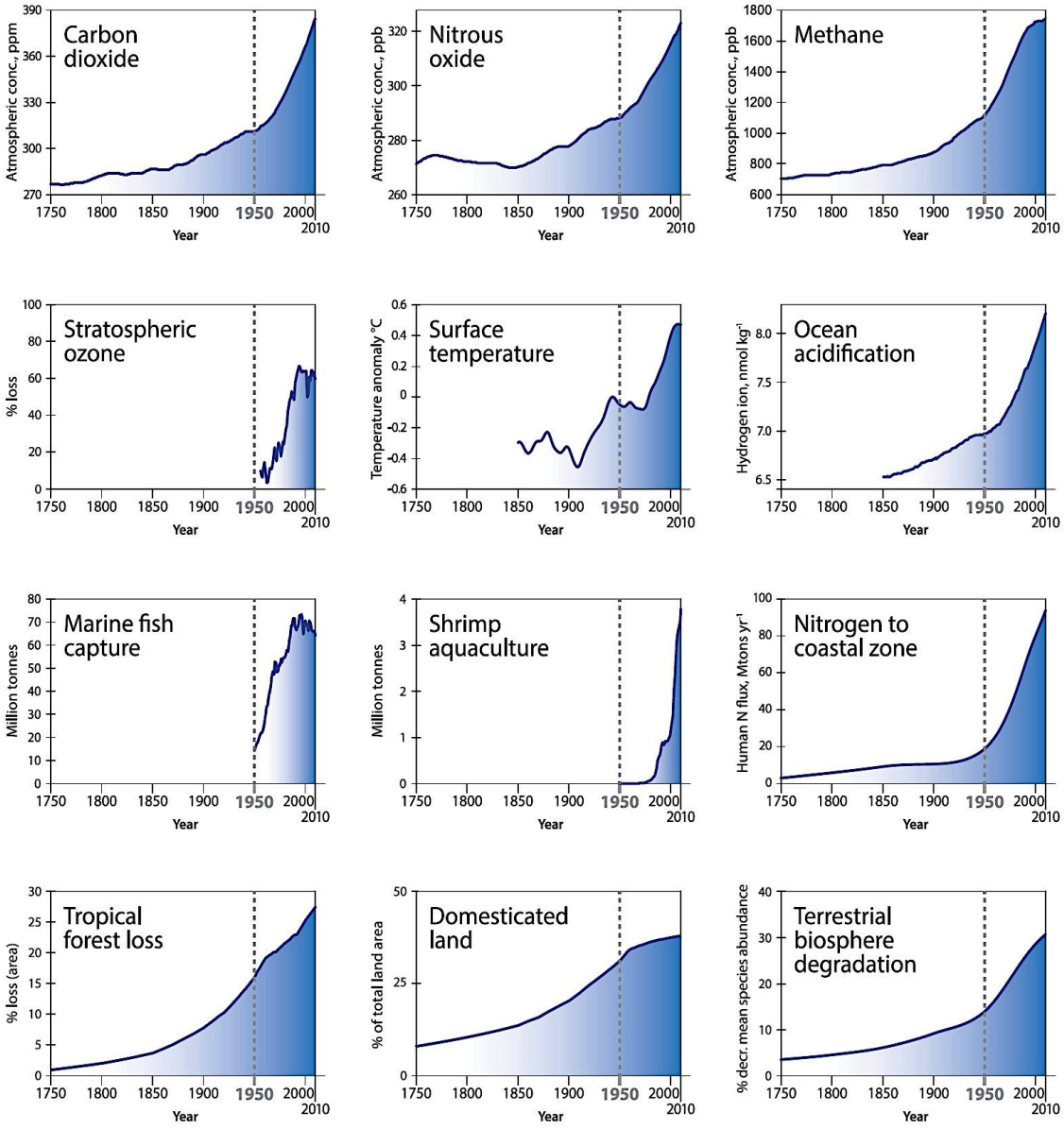



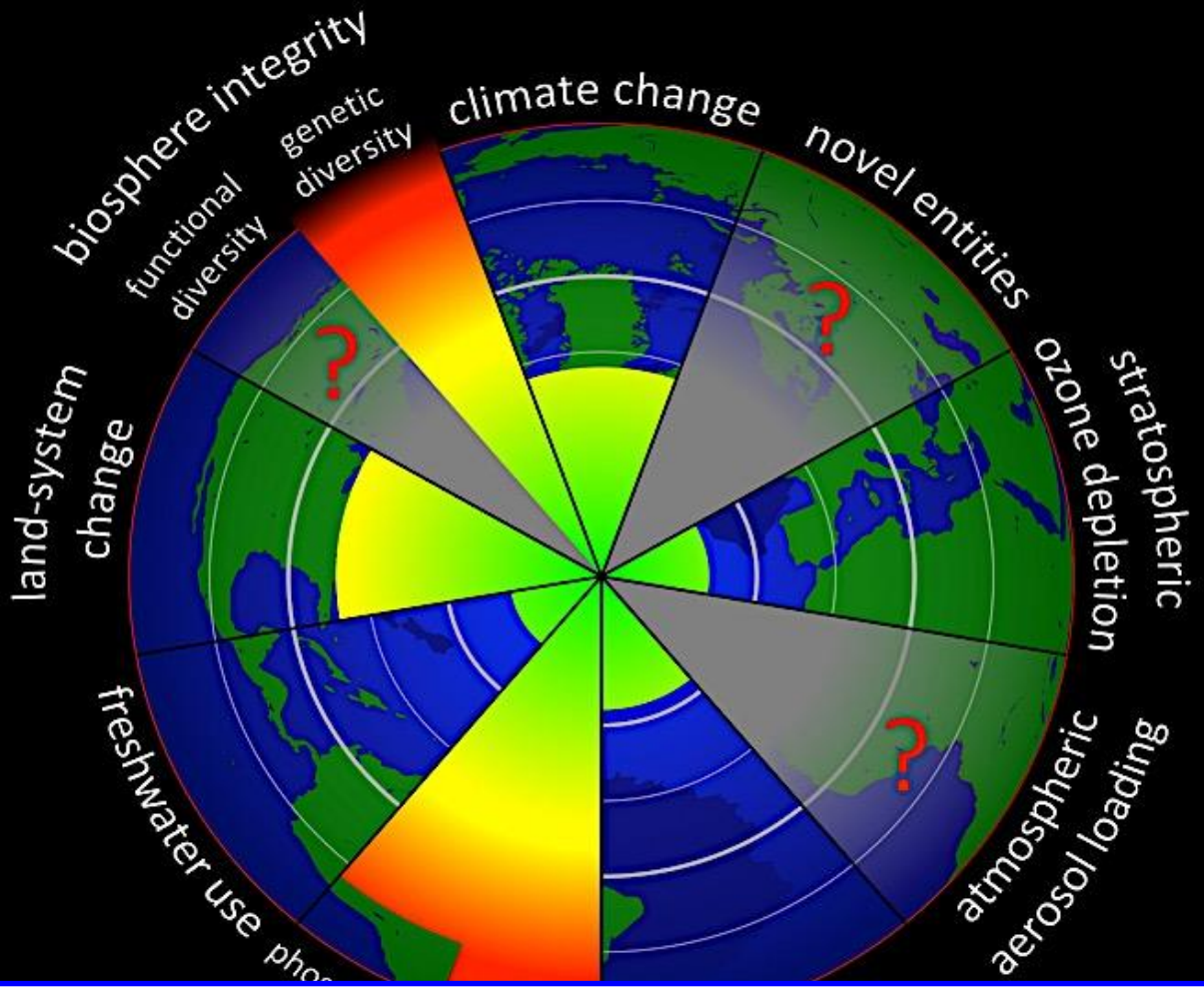



# Earth system trends

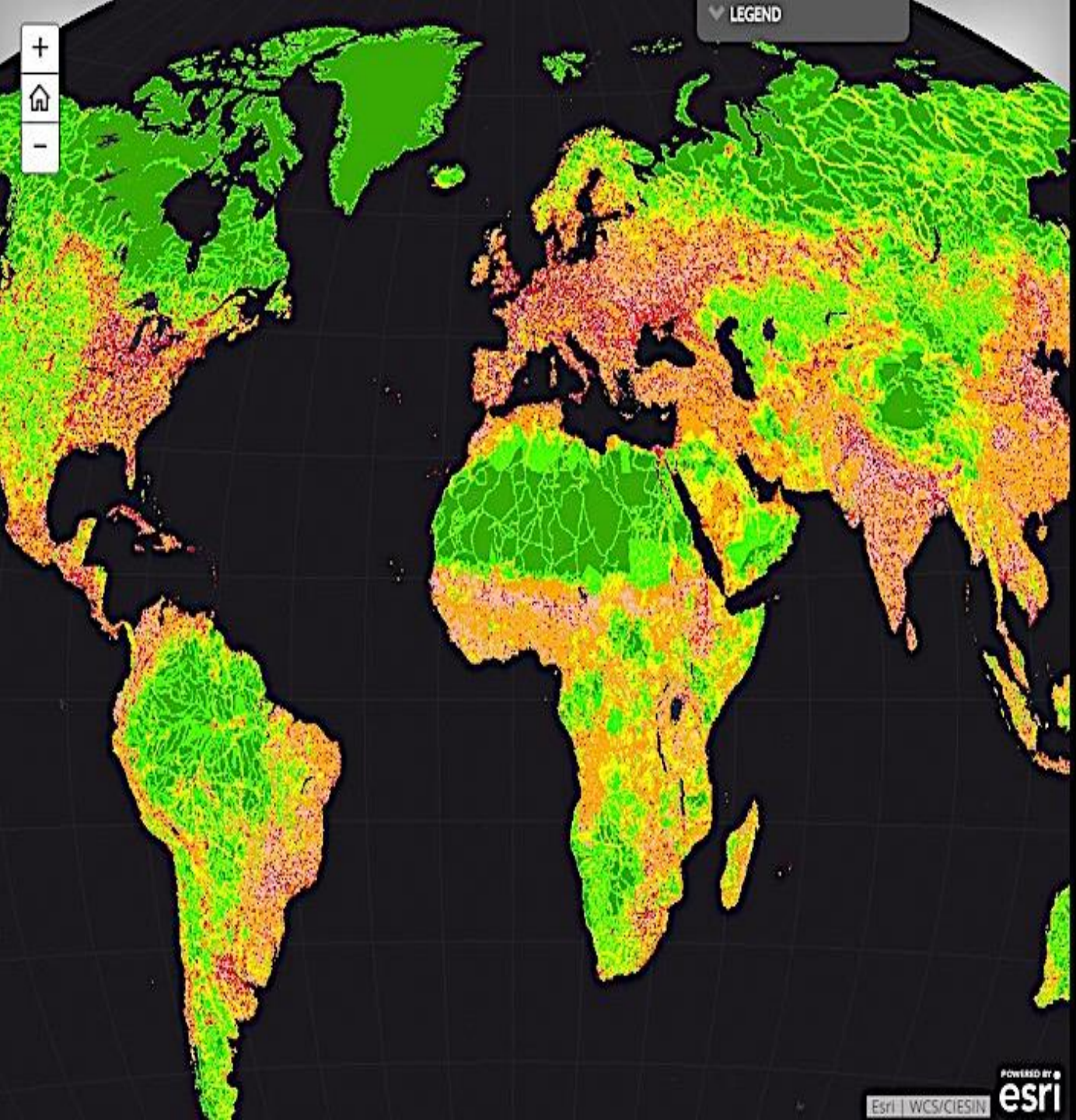


# The Nine Planetary Boundaries




**Johan Rockstöm, Auckland lecture, April 7**

www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html




A story map

esri

# We are Living in The Age of Humans

# 75%

of Earth's land surface outside of ice sheets is managed by humans.

The map at left, developed by the Wildlife Conservation Society, reflects patterns of roads, urban concentrations, agriculture and other factors to show the extent of human modification of the landscape. Green represents minimal human impact; orange, red and purple reflect a high degree of human activity.

CLICK on the locations below to see examples of highly managed landscapes:

**The Netherlands** is home to this geometric array of fields and villages called the Zuiderzeewerken, an expanse of reclaimed land created by diking and draining portions of the Zuiderzee, a shallow inlet of the North Sea.

**British Columbia, Canada** has been transformed by intensive clear-cut logging. Vast woodland tracts in western Canada and the United States have become

# THE TOP MEAT AND DAIRY CORPORATIONS EMIT MORE GHGs THAN EXXON, SHELL OR BP

Meat and Dairy company emissions in $MtCO_2e$ (2016); Oil company emissions (2015)


**TOP 5 MEAT AND DAIRY EMITTERS**

1 JBS

2 TYSON

3 CARGILL

4 DAIRY FARMERS OF AMERICA

5 FONTERRA GROUP

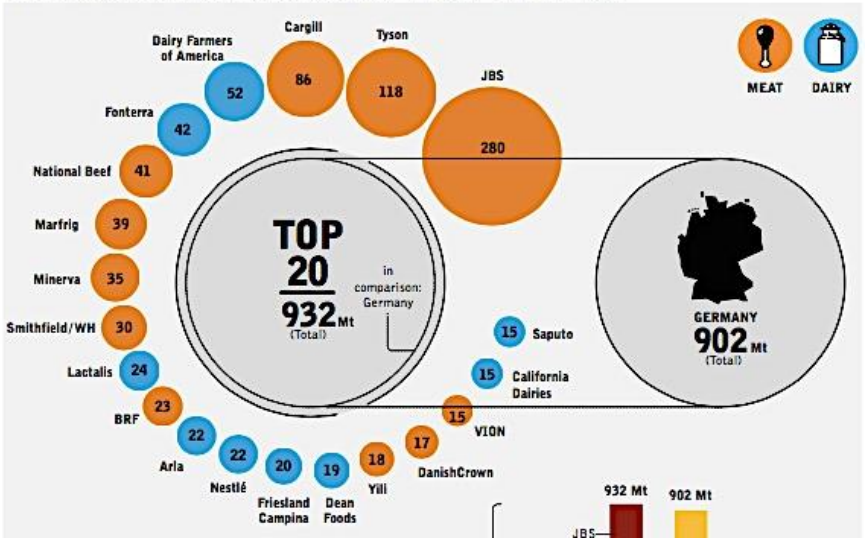
- Livestock farming's impact on climate change:

  https://www.grain.org/article/entries/5825-big-meat-and-dairy-s-supersized-climate-footprint

HEINRICH BÖLL STIFTUNG | Institute for Agriculture & Trade Policy EUROPE | GRAIN

## BIG MEAT AND DAIRY'S SUPERSIZED CLIMATE FOOTPRINT

THE TOP 20 MEAT AND DAIRY CORPORATIONS EMIT MORE GREENHOUSE GASES (GHGs) THAN GERMANY

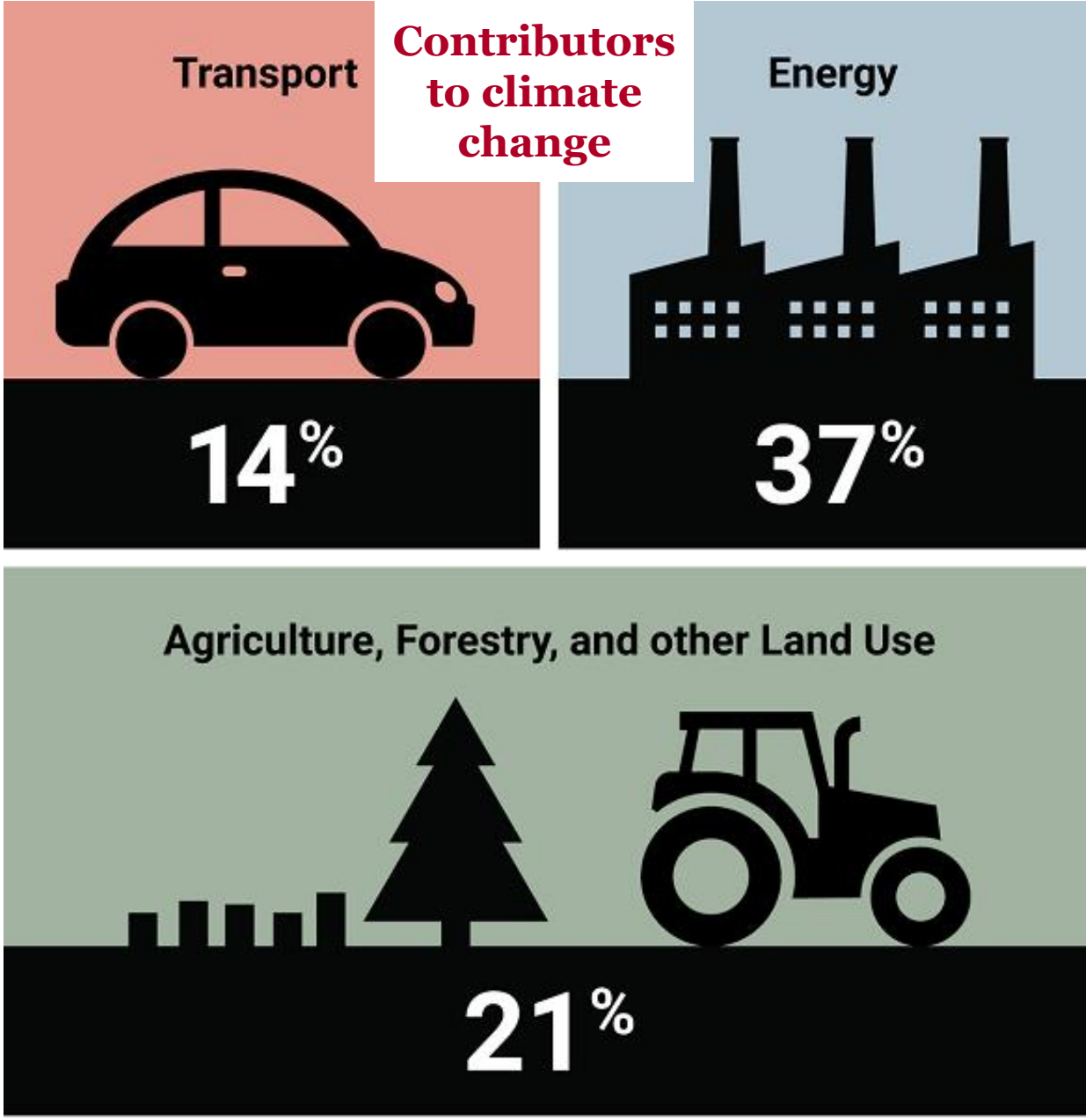


# Monumental global challenges

- Are there technological and economic pathways for big cuts in global emissions in next 20 years?

  …driven by massive R&D and business investment?

- Electricity? Yes!
- Transport? Yes!
- Industry & buildings? Yes!
- Agriculture? **Yes**!
- ...but NZ should be a global leader on transforming agricuture...and we aren't




WELCOME
TO THE Fabulous
ANTHROPOCENE
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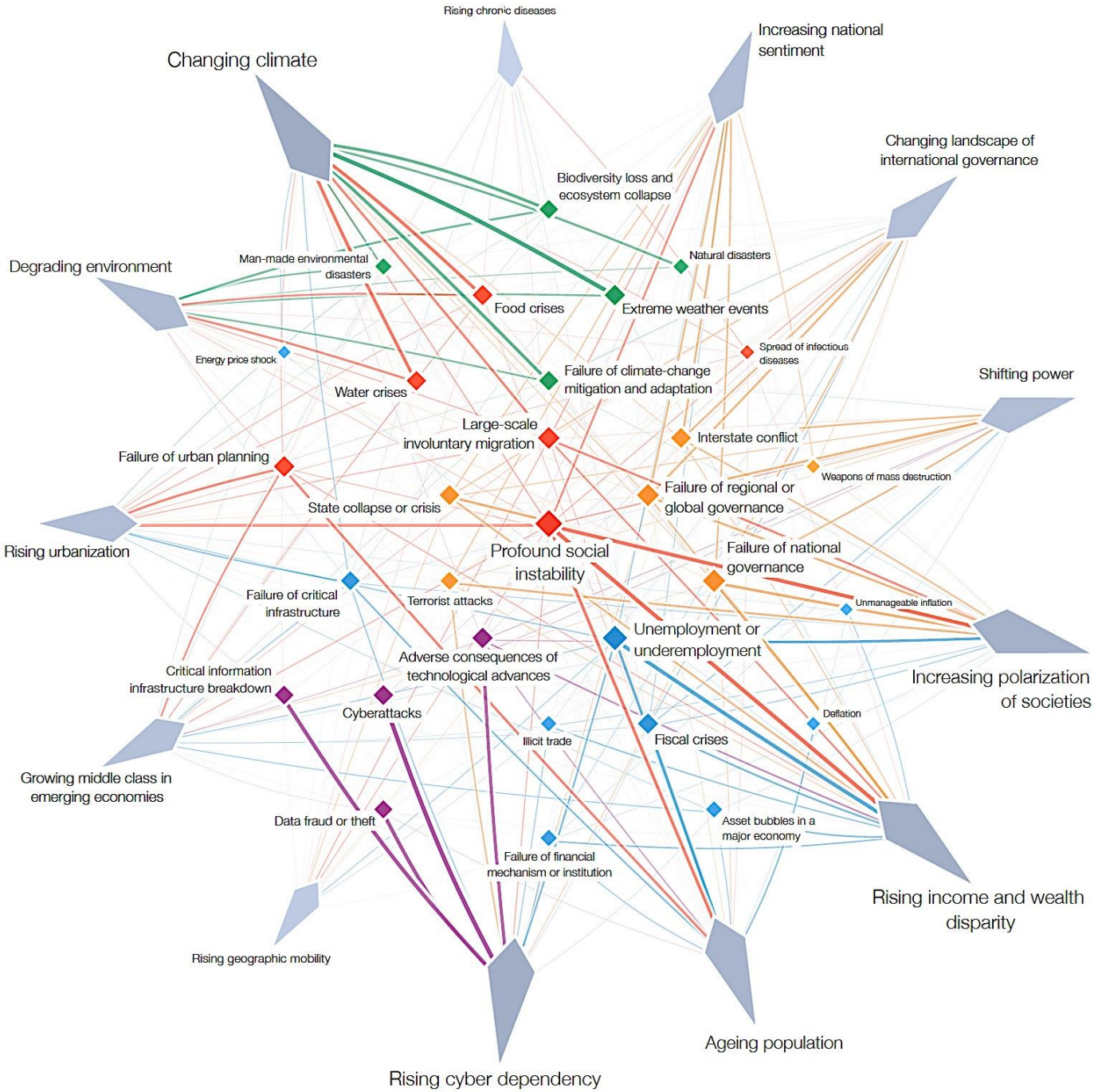
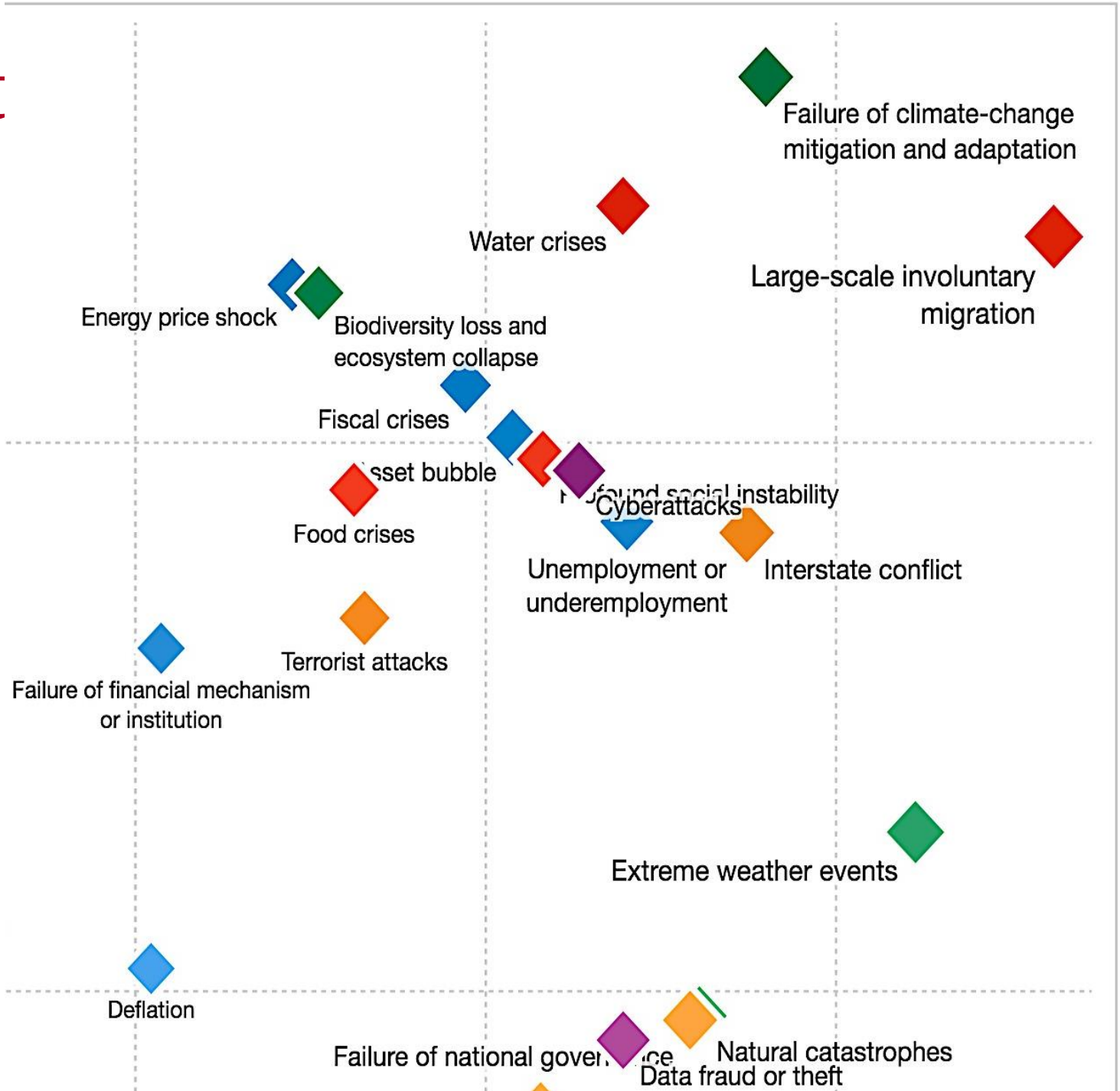
Insight Report

# The Global Ris Report 2018 13th Edition




- https://www.we eports/the-glob report-2018

# Biggest risks

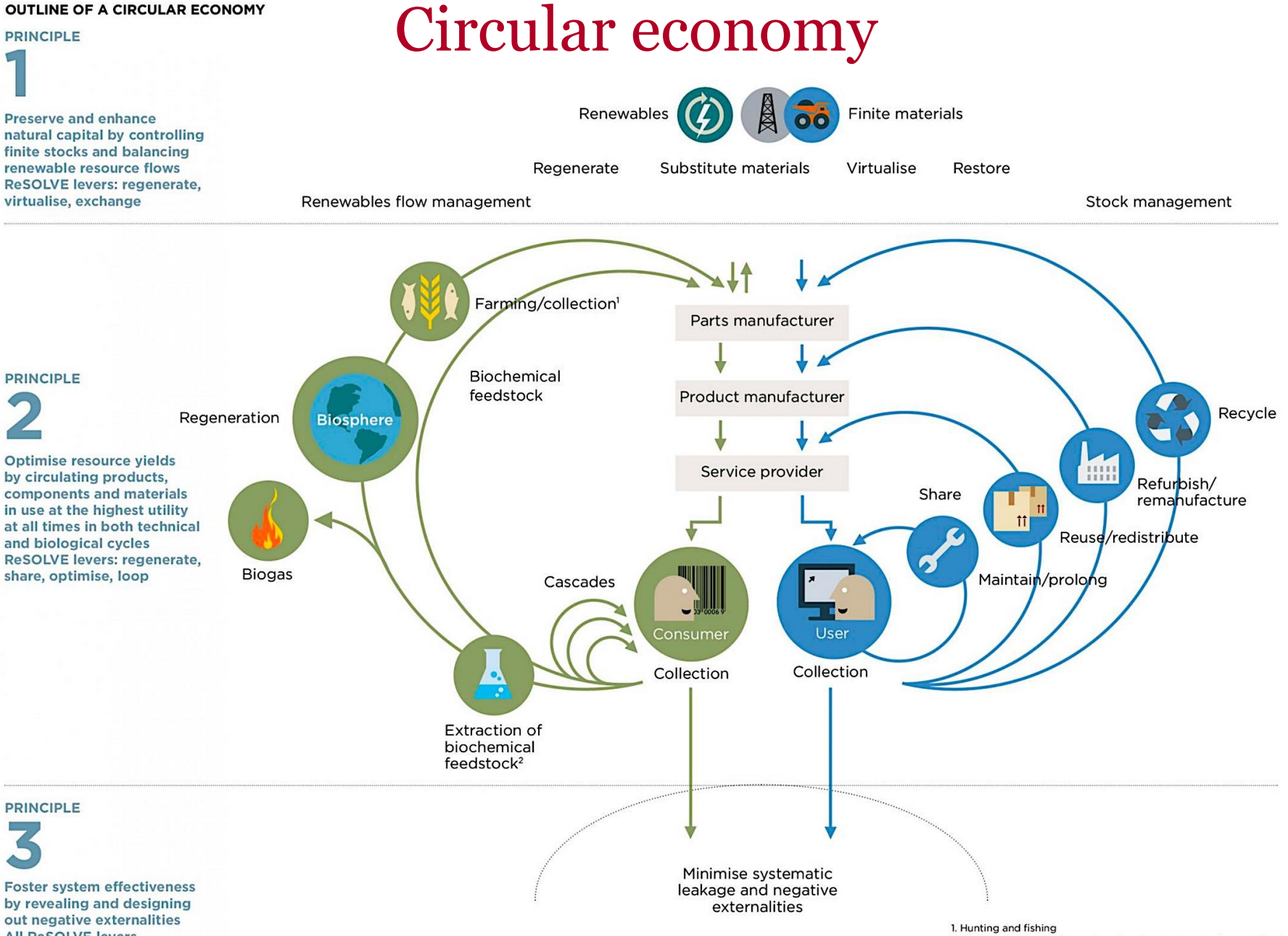


# Agenda

- Home
- **Reinvention**
- Aotearoa


1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
THE GLOBAL GOALS
For Sustainable Development
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

# Circular economy



Finless Foods is an early-stage biotechnology company whose mission is to develop and mass manufacture pioneering marine animal food products for human consumption. Our objective is to create seafood sustainably using scientific cellular agriculture technologies, which will provide a cost-effective and healthier appetizing alternative to conventionally-caught and commercially-farmed seafood.

## "THE HOTTEST TECH IN SILICON VALLEY MADE THIS MEATBALL."

*— FORTUNE MAGAZINE*

## "BILL GATES AND RICHARD BRANSON BACK STARTUP THAT GROWS CLEAN MEAT"

*— BLOOMBERG*

## "STARTUP SERVES CHICKEN FROM THE LAB"

*— WALL STREET JOURNAL*

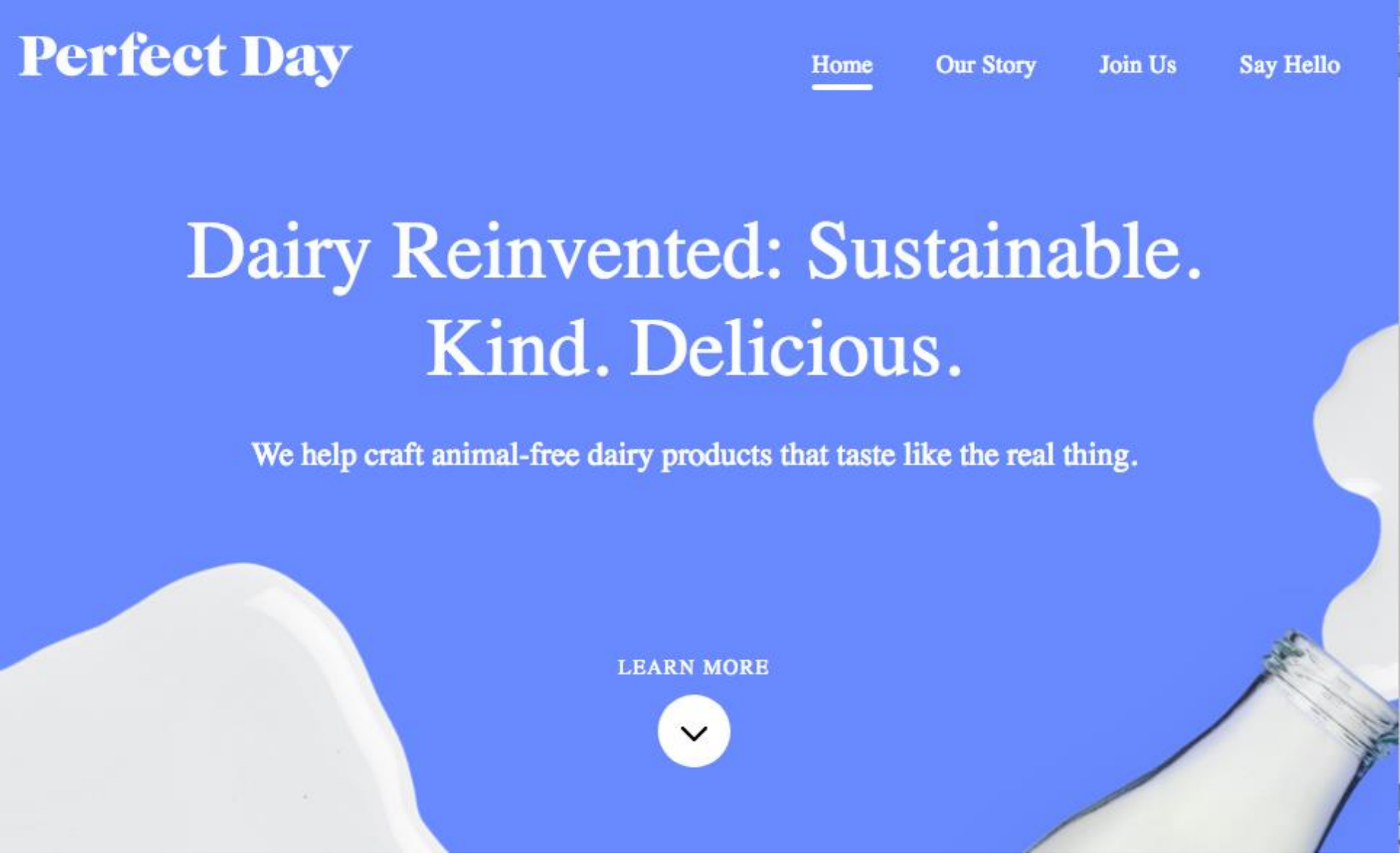
Perfect Day

Home Our Story Join Us Say Hello

# Dairy Reinvented: Sustainable. Kind. Delicious.

We help craft animal-free dairy products that taste like the real thing.

LEARN MORE



WhiteWave

DanoneWave | Who We Are | What We Make | Why We Matter | News | Careers

# Find Out More

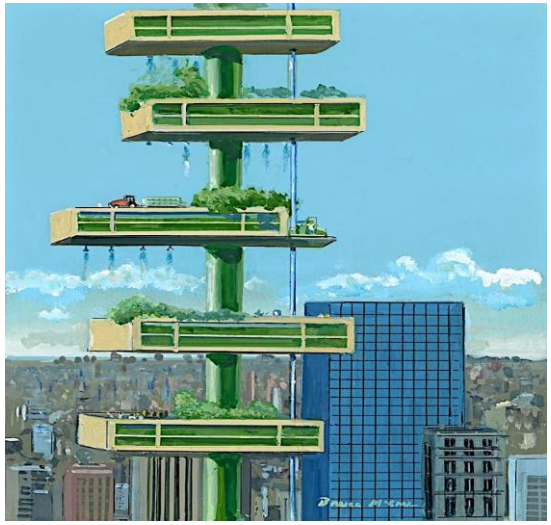
## Welcome to the DanoneWave Revolution

The histories of Danone and WhiteWave share common traits as purpose-driven, health-focused category leaders, which make for a perfect match. DanoneWave's ambition is to produce healthful foods that create economic and social value and nurture natural ecosystems through sustainable agriculture. We will accelerate Danone's 2020 sustainable profitable growth journey by offering a wider choice of better-for-you and great tasting food and beverage alternatives for any moment of the day.

Bringing together our portfolios of dairy and plant-based products enables us to better serve consumers' diverse preferences in high growth and evolving categories.

# Vertical farming

- ...an example in New Jersey: AeroFarms, http://aerofarms.com
- *New Yorker* magazine Jan 2017 http://www.newyorker.com/magazine/2017/01/09/the-vertical-farm

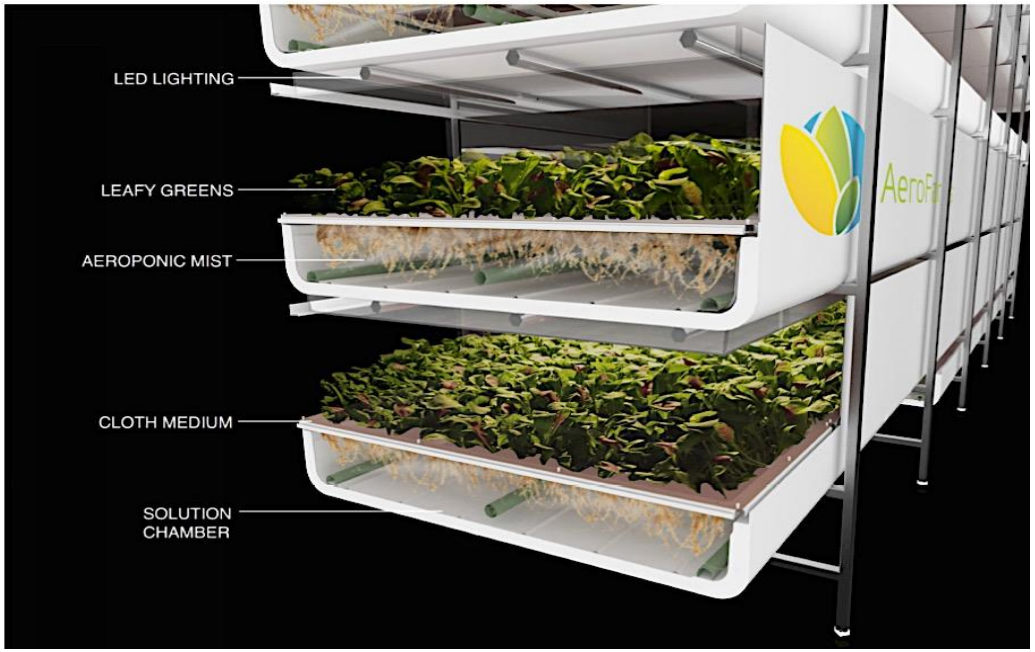


AeroFarms®

OUR STORY | TECHNOLOGY | PRODUCTS | PARTNERS | NEWS | BLOG | CAREERS | CONTACT

## We Are Transforming Agriculture

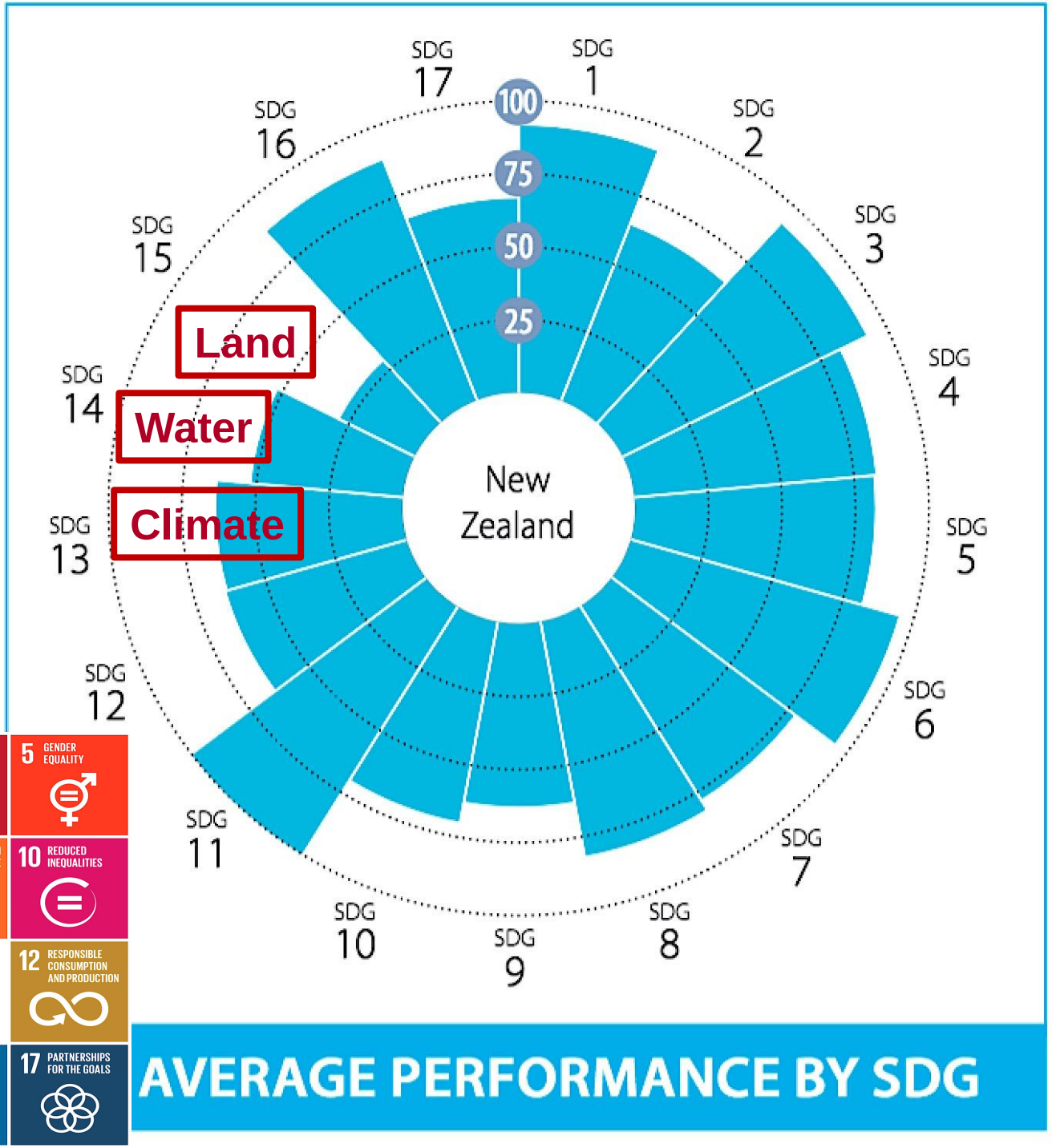
We grow delicious, nutritious leafy greens and herbs without sunlight, soil, or pesticides. Our crops get the perfect amount of moisture and nutrients misted directly onto their roots in a completely controlled environment. With our patented technology, we take indoor vertical farming to a new level of precision and productivity with minimal environmental impact and virtually zero risk.



# Agenda

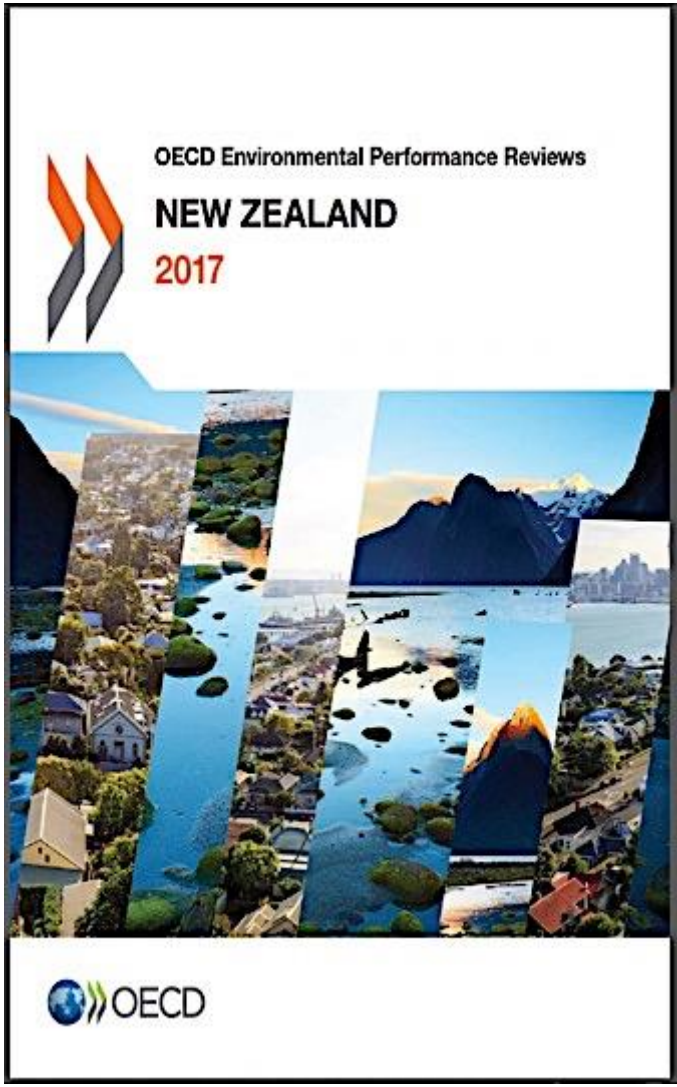
- Home
- Reinvention
- **Aoteroa**

# We perform poorly on our core natural capital




# OECD's verdict

- "New Zealand's growth model...has started to show its environmental limits, with increased GHG emissions, freshwater contamination and threats to biodiversity.
- "Addressing GHG emissions from agriculture, and especially dairy farming, should remain a priority...
- "...the need to further explore the economic opportunities that more sustainable uses could yield.
- "Developing a long-term vision for a transition towards a low-carbon, greener economy would help New Zealand defend the "green" reputation it has acquired at an international level."



# Our Paris commitment

- NZ's current target is to reduce our greenhouse gas emissions by 30% below 2005 levels by 2030.

- This target is equivalent to 11% below 1990 levels by 2030
- Yet, California's bi-partisan, mandated goal is a 40% cut from 1990 levels by 2030

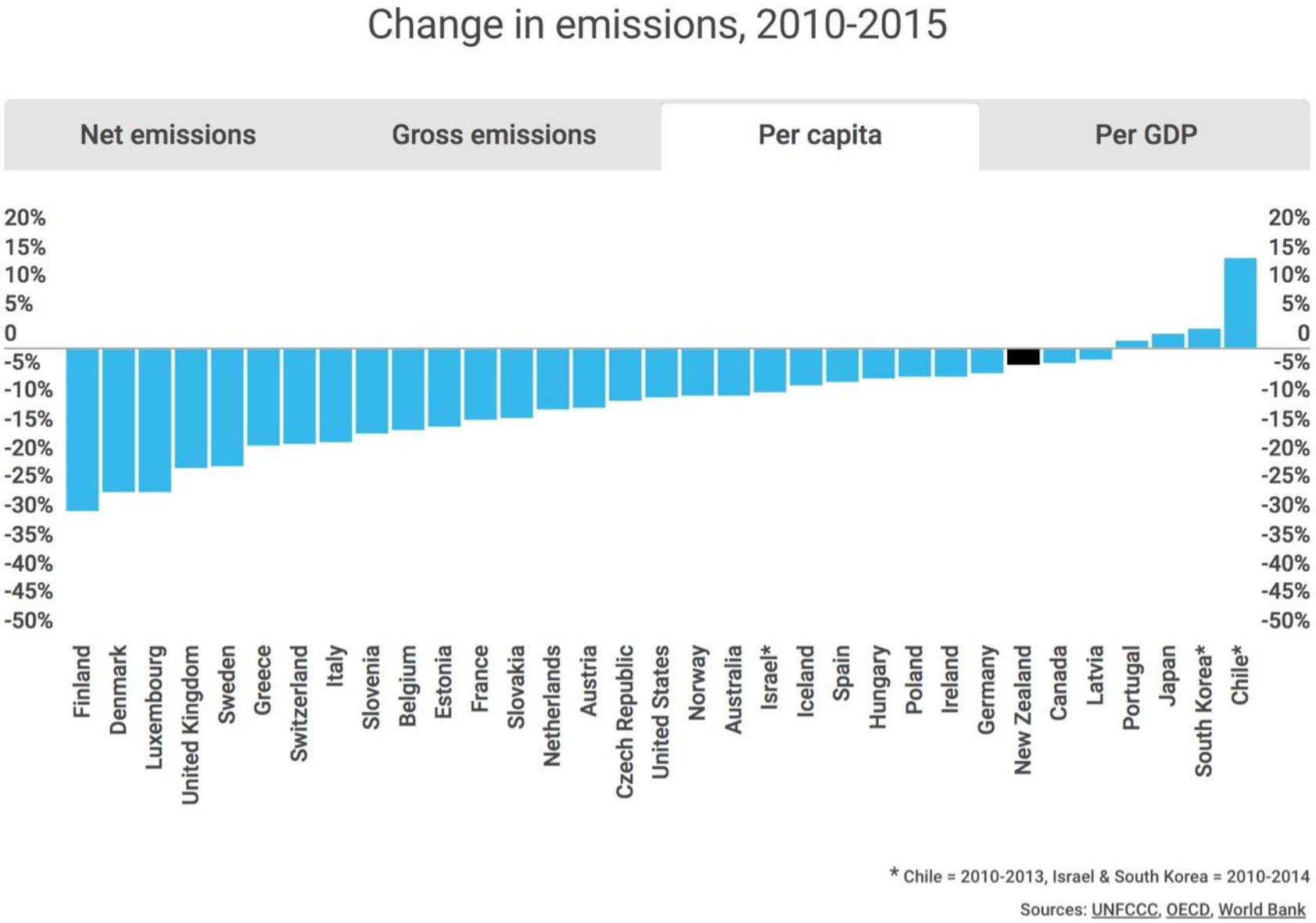
# What we say…is not what we do

- We're missing our Paris commitments by miles

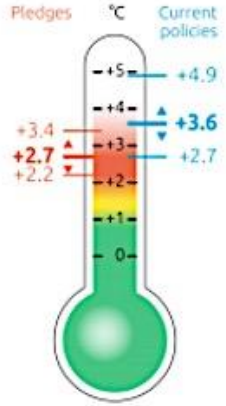
**Figure 3** **New Zealand's net emissions from 1990 to 2013, future projections and current emission targets for 2020, 2030 and 2050**


*Source:* MfE (2015a)

# NZ: poor GHG performance per capita



# CLIMATE ACTION TRACKER




Thermometer shows the global-mean temperature increase above pre-industrial by 2100, with an uncertainty range originating from carbon-cycle and climate modelling




The "Climate Action Tracker" is an independent science-based assessment, which tracks the emission commitments and actions of countries. The website provides an up-to-date assessment of individual national pledges, targets and INDCs and currently implemented policy to reduce their greenhouse gas emissions.

## Zero emission vehicles need to take over car market to reach 1.5°C limit: analysis

15th September 2016

Zero-emission vehicles need to reach a dominant market share by around 2035 for the world to meet the Paris Agreement's… Read more...

## Paris Agreement: stage set to ramp up climate action

12th December 2015

Click here for briefing. From the perspective of the Climate Action Tracker, the Paris Agreement will positively influence the world's ability… Read more...

## Assessing the G20 transition to a low-carbon economy

2nd September 2016

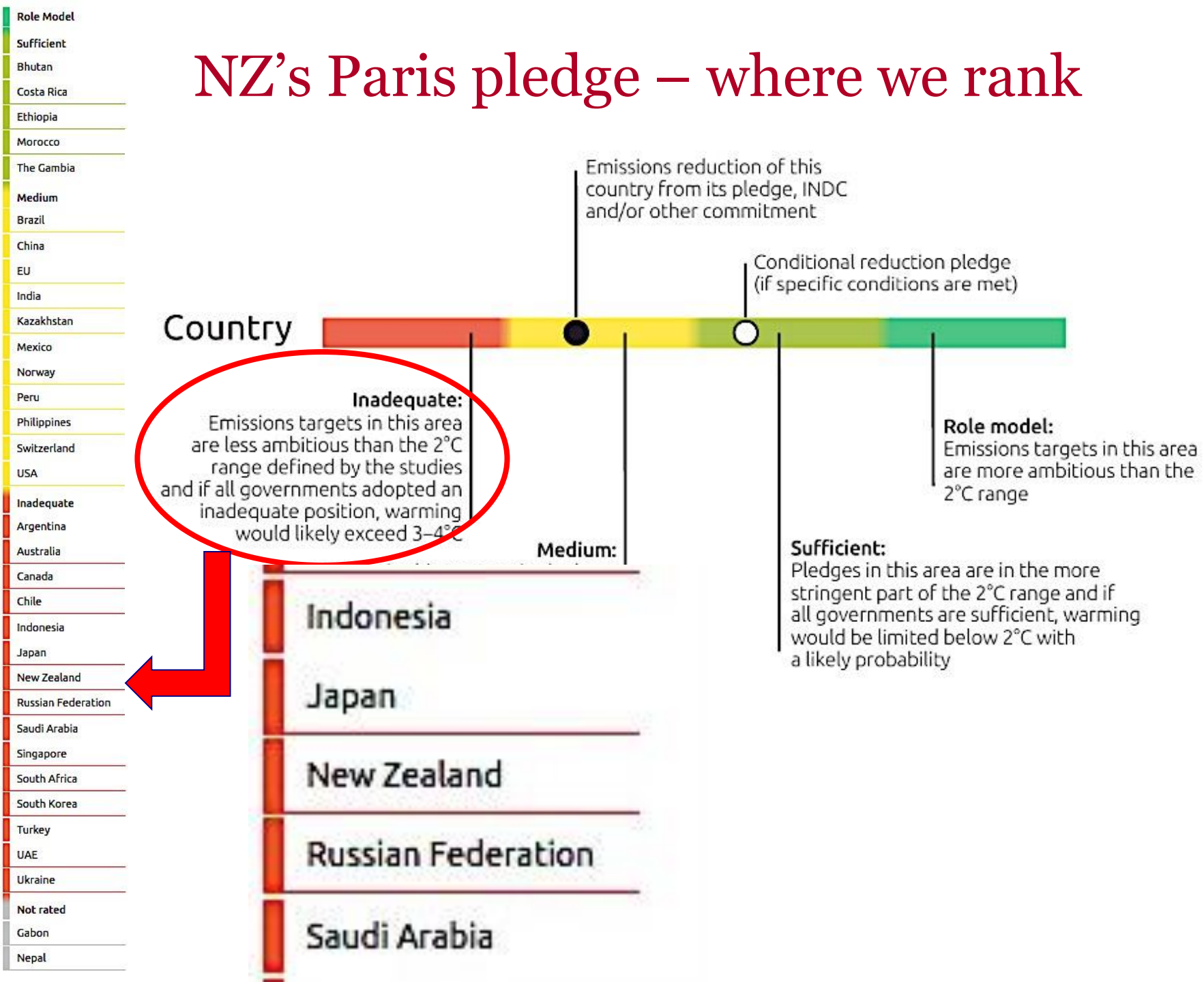
The G20 needs to increase efforts to move to a green, low-carbon economy, especially in the areas of coal power… Read more...

## Climate pledges will bring 2.7°C of warming, potential for more action

8th December 2015

Click here for full briefing. Paris-8 December 2015- With 158 climate pledges now submitted to the UN, accounting for 94%… Read more...

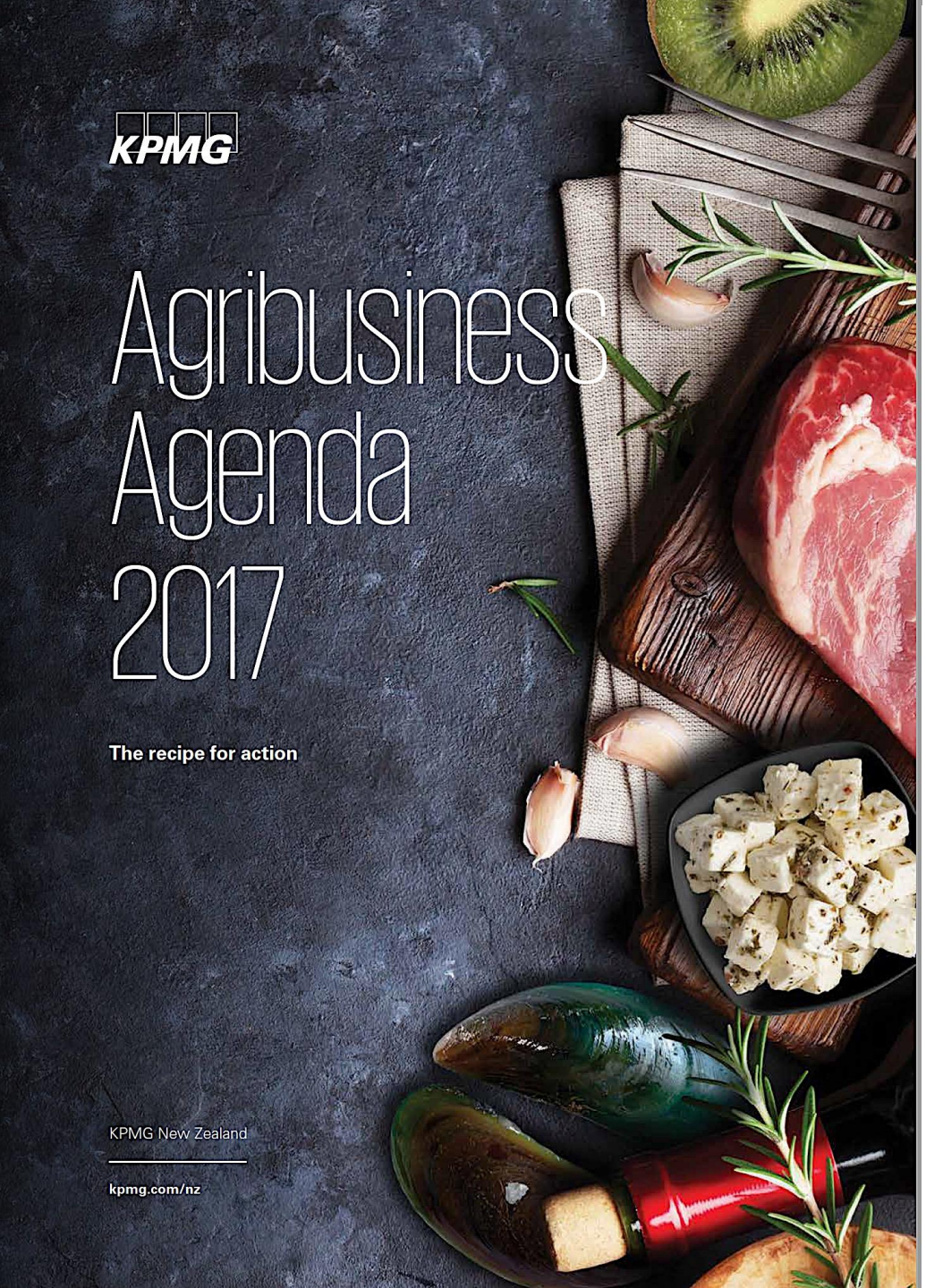
# NZ's Paris pledge – where we rank



# “New Zealand is doing its fair share”- John Key

- “New Zealand’s climate target shows it’s far from doing its ‘fair share,’ and is anything but ambitious,”
  - Bill Hare, CEO and Senior Scientist at Climate Analytics *(one of the science partners in Climate Action Tracker)*

- “If most other countries were to follow New Zealand’s approach, global warming would exceed 3-4ᶜ,
  a world that would see oceans acidify,
  coral reefs dissolving, sea levels rising rapidly, and more than 40% species extinction.”




| RANK | ACTION |
|---|---|
| 1 | World-class biosecurity |
| 2 | Create NZ provenance brands |
| 3 | Food safety strategic importance |
| 4 | Deliver high speed rural broadband |
| 5 | Innovate with customers |
| 6 | Sign high quality trade agreements |
| 7 | Delivering R&D incentives |
| 8 | Increasing rural / urban understanding |
| 9 | Developing future leaders |
| 10 | Deliver market signals to producers |

# Top 10 priorities

- Sustainabillity and climate issues rank far outside the sector's top 10 priorities

https://assets.kpmg.com/content/dam/kpmg/nz/pdf/June/agri-agenda-2017-kpmg-nz.pdf

# Sustainability: Theme 4, Priorities 11, 17 & 37


Pursuing sustainability first — no debate!

RELEVANT SURVEY RANKINGS TO THIS THEME:

**2017** PRIORITY RANK NUMBER:

11th

**Penalties for those that don't protect animals**

**2016** PRIORITY RANK NUMBER: N/A

**2017** PRIORITY RANK NUMBER:

17th

**Schemes to regenerate native ecosystems**

**2016** PRIORITY RANK NUMBER: 17

**2017** PRIORITY RANK NUMBER:

37th

**Implement water costing mechanism**

**2016** PRIORITY RANK NUMBER: 35

The impact that the agri-food sector has on our natural environment was a dominant theme in many of our conversations this year. We came away from the discussions with little doubt that the majority of our contributors recognise that the future prospects for the industry are inextricably linked to its stewardship of the environment and water. It was also apparent that, for most leaders, sustainability is a bigger conversation than just that about the land and water; it is also about the role they take in ensuring their animals live good lives, and their employees are treated respectfully and kept safe, and in contributing to making New Zealand a better place for all New Zealanders.

Recognition that the industry's licence to operate is no longer guaranteed is shaping the thinking of many of our contributors on how their organisations and industries need to act to become truly sustainable. They acknowledge that, as the contribution that the tourism sector makes to the economy increases, perception grows that the dependency on the wealth generated from agri-food is waning. The implication of this is simple; the wider community is increasingly comfortable with tougher regulations if they preserve our natural environment. They recognise this will protect the ability of the tourism sector to continue to grow its contribution to the economy.

So low, yet, "…the prospects for the industry are intextricably linked to its stewardship of the environment and water."

# Climate change - Priority 48

- "New Zealand should aspire to lead the world in mitigating the impact agriculture has on human-induced climate change but to achieve this requires financial signals.

  The suggestion was made by a number of contributors that the agri-sector should welcome its early inclusion into the emissions trading scheme, with a framework of incentives and penalties to encourage the right behaviours."

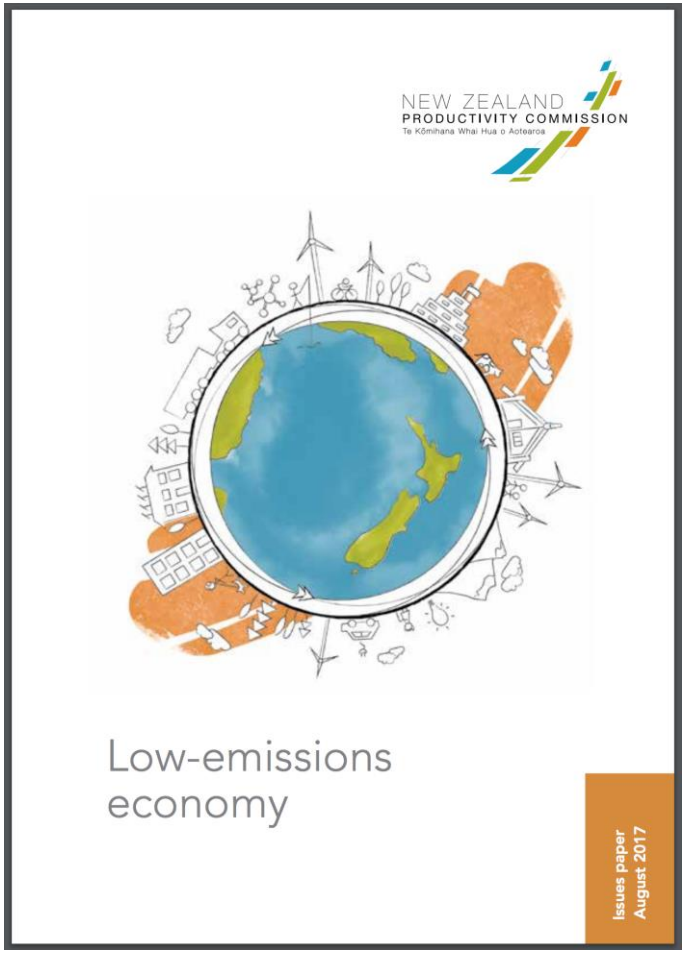
**48**

## Accelerating actions to address climate change obligations.

While the Trump administration has taken a sceptical position to man-made climate change, the rest of the world is operationalising the commitments they made in the Paris Accord in 2015 and accelerating their transitions to low-carbon economies. Given New Zealand's greenhouse gas profile, meeting our commitments requires a significant contribution from the primary sector. New Zealand should aspire to lead the world in mitigating the impacts that agriculture has on human-induced climate change but to achieve this requires financial signals. The suggestion was made by a number of contributors that the agri-food sector should welcome its early inclusion into the emissions trading scheme, with a framework of incentives and penalties to encourage the right behaviours.

# "…the shift…will be profound and widespread"

- "…the shift from the old economy to a new, low-emissions economy will be profound and widespread, transforming land use, the energy system, production methods and technology, regulatory frameworks and institutions, and business and political culture."




- New Zealand Productivity Commission *Low-emmissions economy, August 2017*
- http://www.productivity.govt.nz/inquiry-content/3254?stage=2

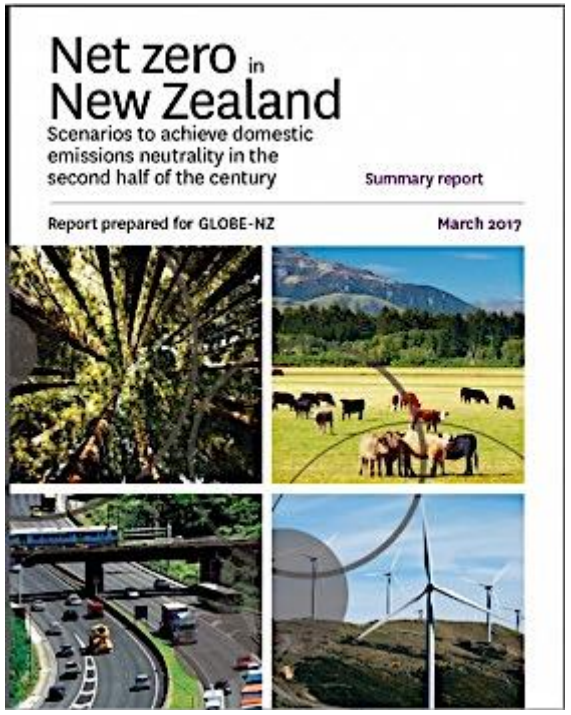
- Final report, with recommendations due June 30, 2018

# Remedy: Net Zero New Zealand

- Very encouraging NZ roadmap to a low carbon economy, including the primary sector
  - ...and the dangers of sticking where we are
- Commissioned by Compass-NZ (all-party group of MPs), business and others
- Report produced by Vivid Economics of the UK

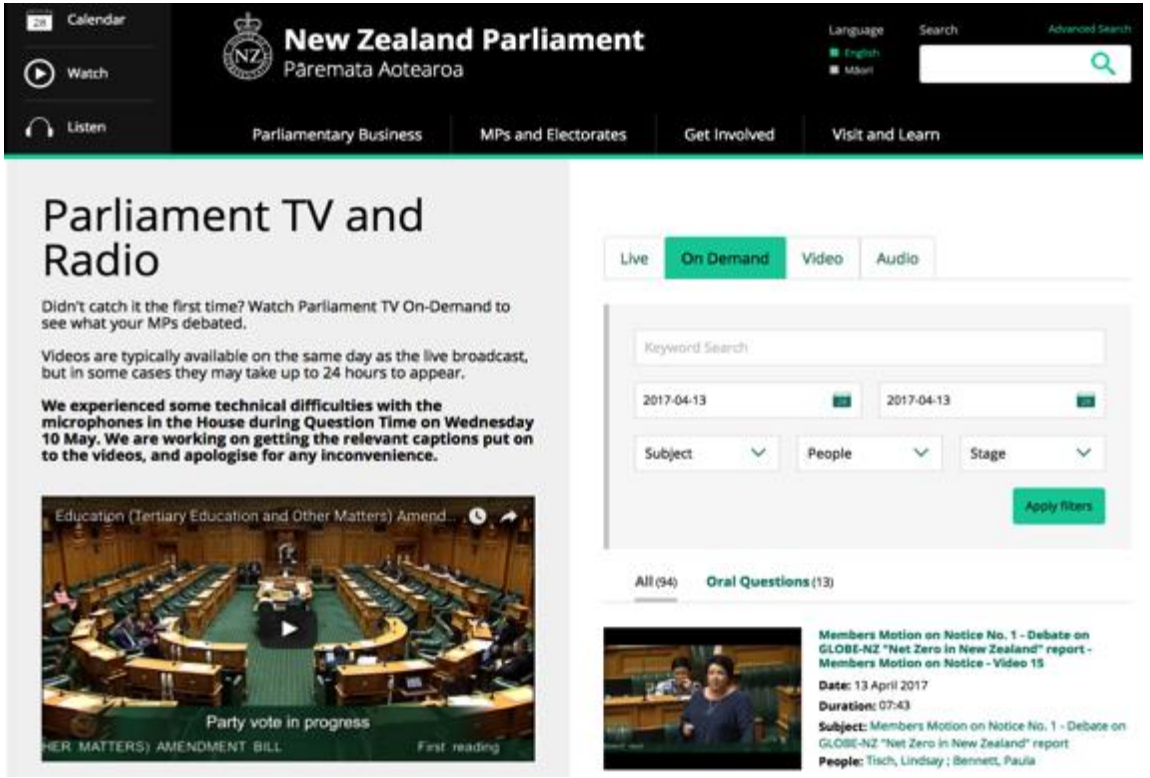
- Report: http://www.vivideconomics.com/wp-content/uploads/2017/04/Net-Zero-in-New-Zealand-Summary-Report-Vivid-Economics.pdf

- Slides from Beehive launch:
- http://www.vivideconomics.com/wp-content/uploads/2017/04/Net-Zero-New-Zealand-Beehive-launch-slides.pdf



# Civil and constructive debate…

- …in Parliament?
- Yes!




- …the debate: https://www.parliament.nz/en/watch-parliament/ondemand?keyword=&from=2017-04-13&to=2017-04-13&subject=&person=&stage

# Change at home

# Lots we can do on agricultural GHG

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

## Climate change and agriculture: Understanding the biological greenhouse gases

19 October 2016

In this report the Commissioner examines the issue of agricultural greenhouse gases – methane and nitrous oxide – which together form about half of New Zealand's greenhouse gas emissions. This high proportion of emissions coming from agriculture is a major challenge for New Zealand. The science is complex and the policy debate is polarised.

The main policy 'instrument' in New Zealand for reducing greenhouse gas emissions is the Emissions Trading Scheme (ETS). The biological gases from agriculture have not yet been included in the ETS. Some argue they should be; others make the opposite case.

This particular dispute, however, lies within a bigger question – what, if anything, should we do about the methane and nitrous oxide from agriculture? Our efforts to answer this question will be more efficient and constructive if we have a common understanding of the basic science. It is hoped that this report will help develop that understanding.

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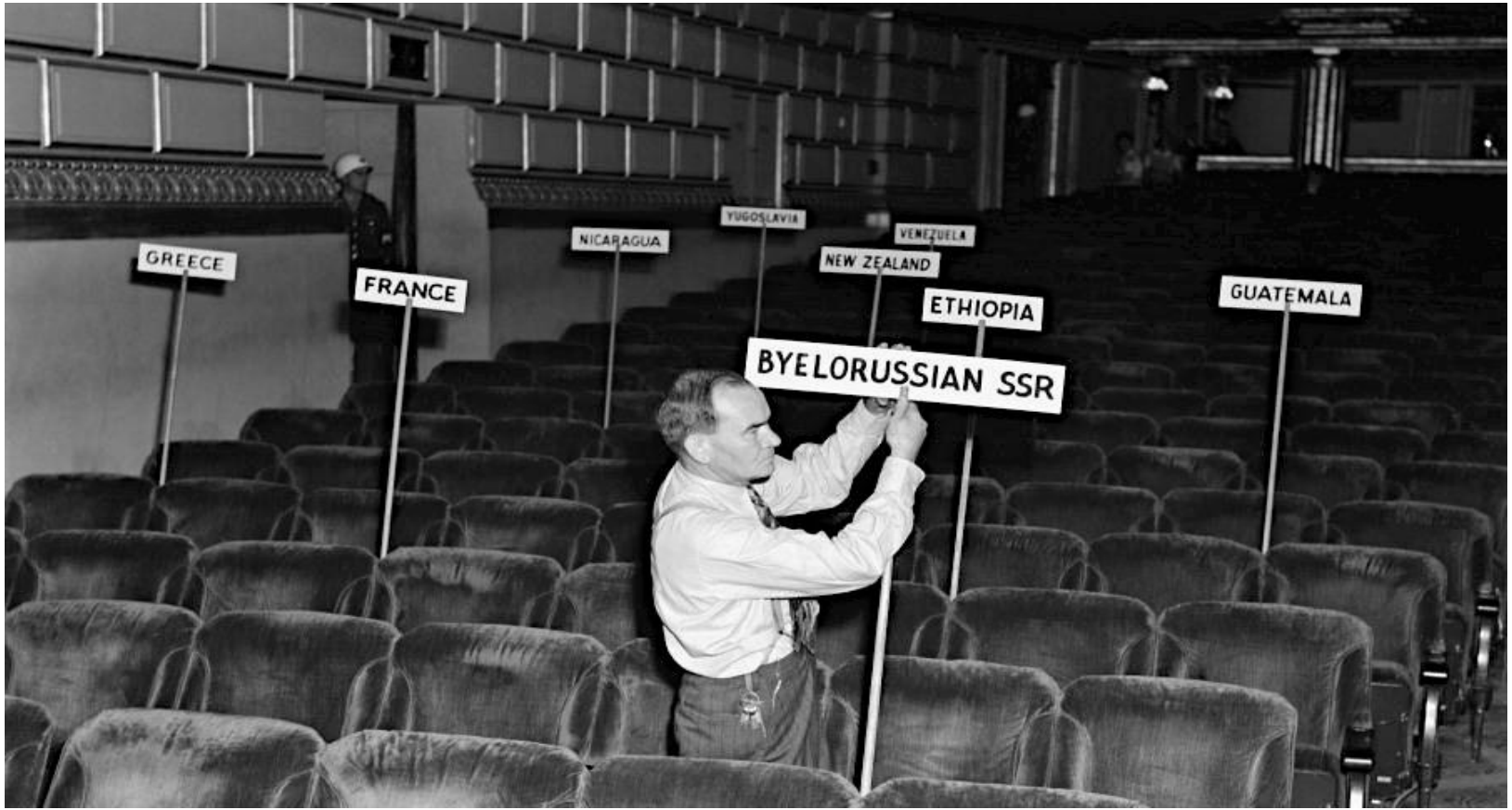
## PROLOGUE

*As a member of the Joint Project Committee, Pure Advantage is pleased to be involved in the release of Net Zero New Zealand. The report was authored by London-based Vivid Economics under contract to GLOBE-NZ, a national chapter of GLOBE-International, the worldwide association of parliamentarians working to protect and improve the environment. The analysis included a substantial programme of engagement with stakeholders from government, business and civil society in New Zealand.*

*Net Zero New Zealand is one of the first attempts to use scenario analysis to help illuminate New Zealand's long-term low-emission pathways in order to meet the country's obligations under the Paris Agreement. The report identifies four domestic emission reduction scenarios through 2050 which would position New Zealand to achieve emissions neutrality later in the century. The three elaborated scenarios are: Off Track*

# NZ's crucial contribution to Paris...

- ...we proposed the concept of each country determining its own contribution to reducing carbon – this broke the years-long deadlock in global climate negotations
- We are very useful in such global forums...as we were e.g. at founding of the UN in San Francisco in 1945
- ...but we have to live up to the standards we expect of others

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