Reinventing Paradise

Our life support system

Rod Oram's presentation to the Philanthropy NZ Summit
Wellington, May 16th, 2019

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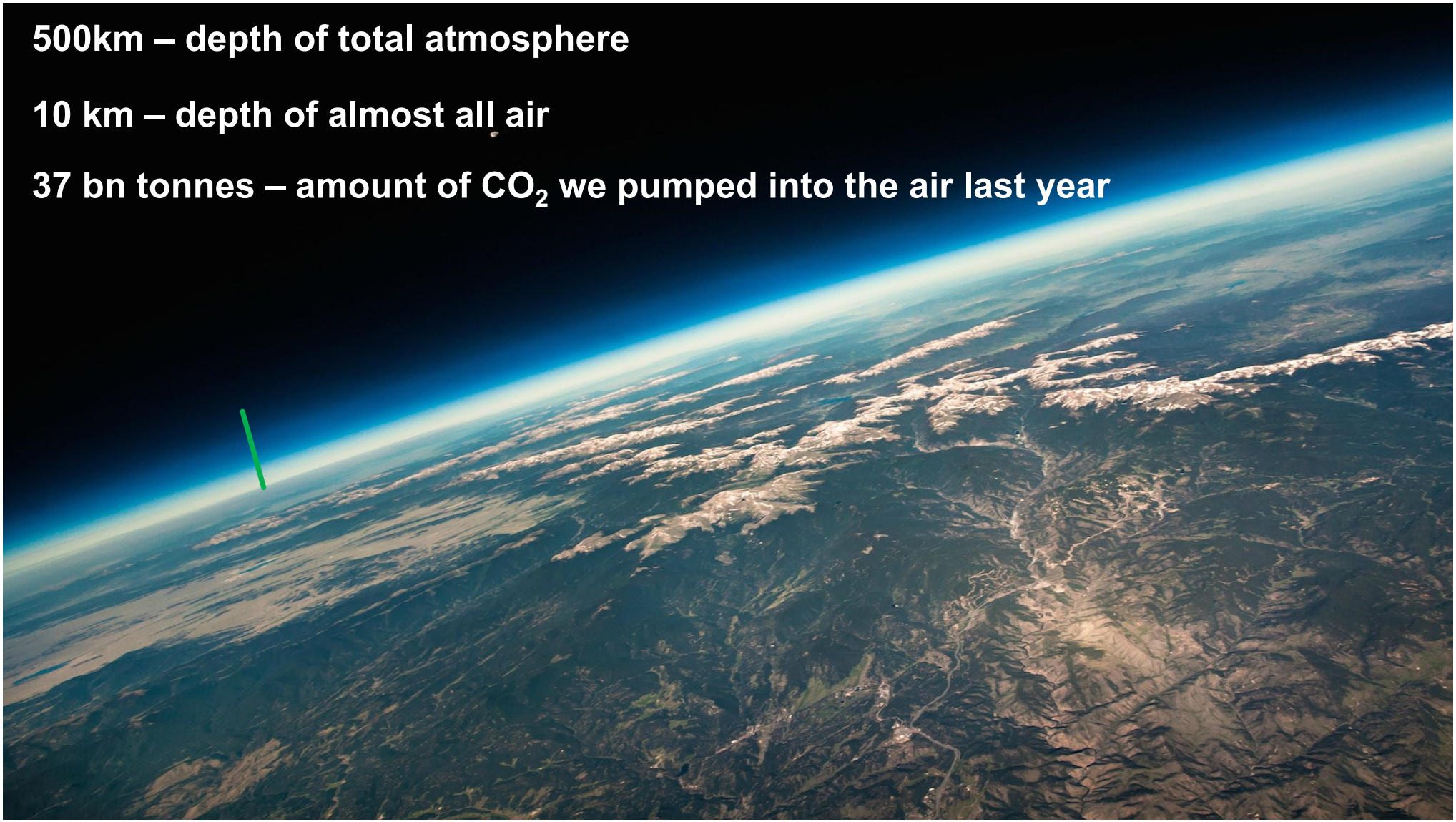
Newsroom.co.nz / Twitter @RodOramNZ

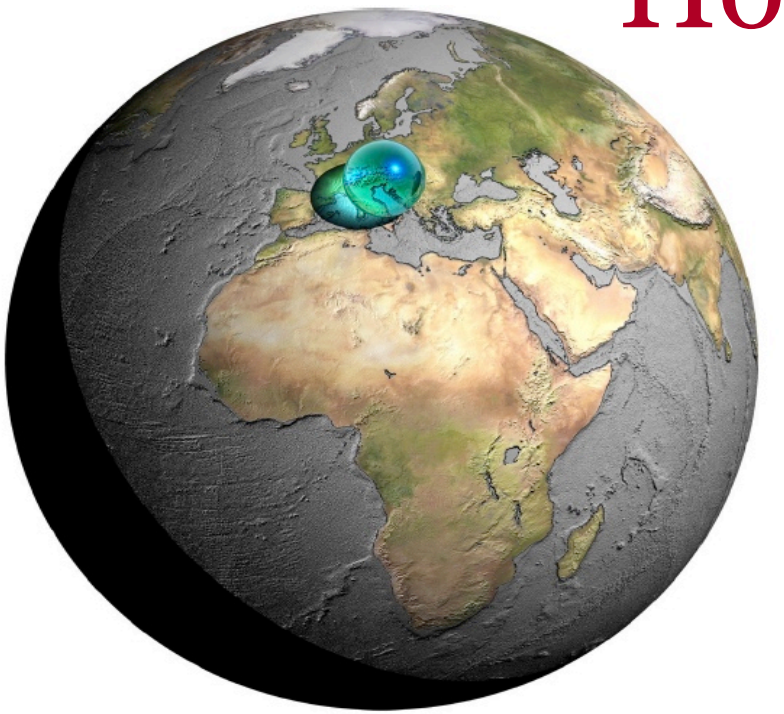
Agenda

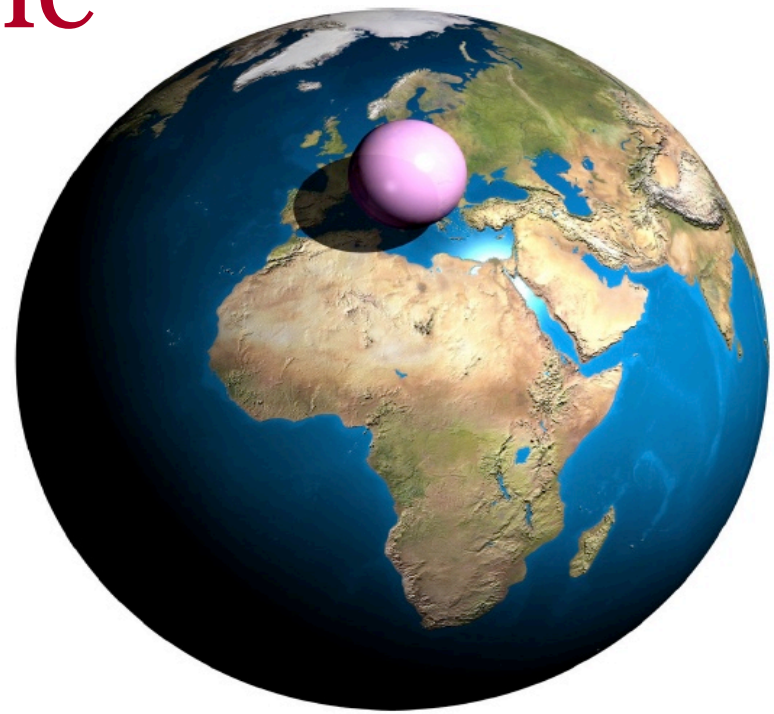
- **Home**
- **Revolution**
- **Aotearoa**

Home


500km – depth of total atmosphere
10 km – depth of almost all air
37 bn tonnes – amount of CO_2 we pumped into the air last year

Home





- **<u>All water</u>**

1,390 km across

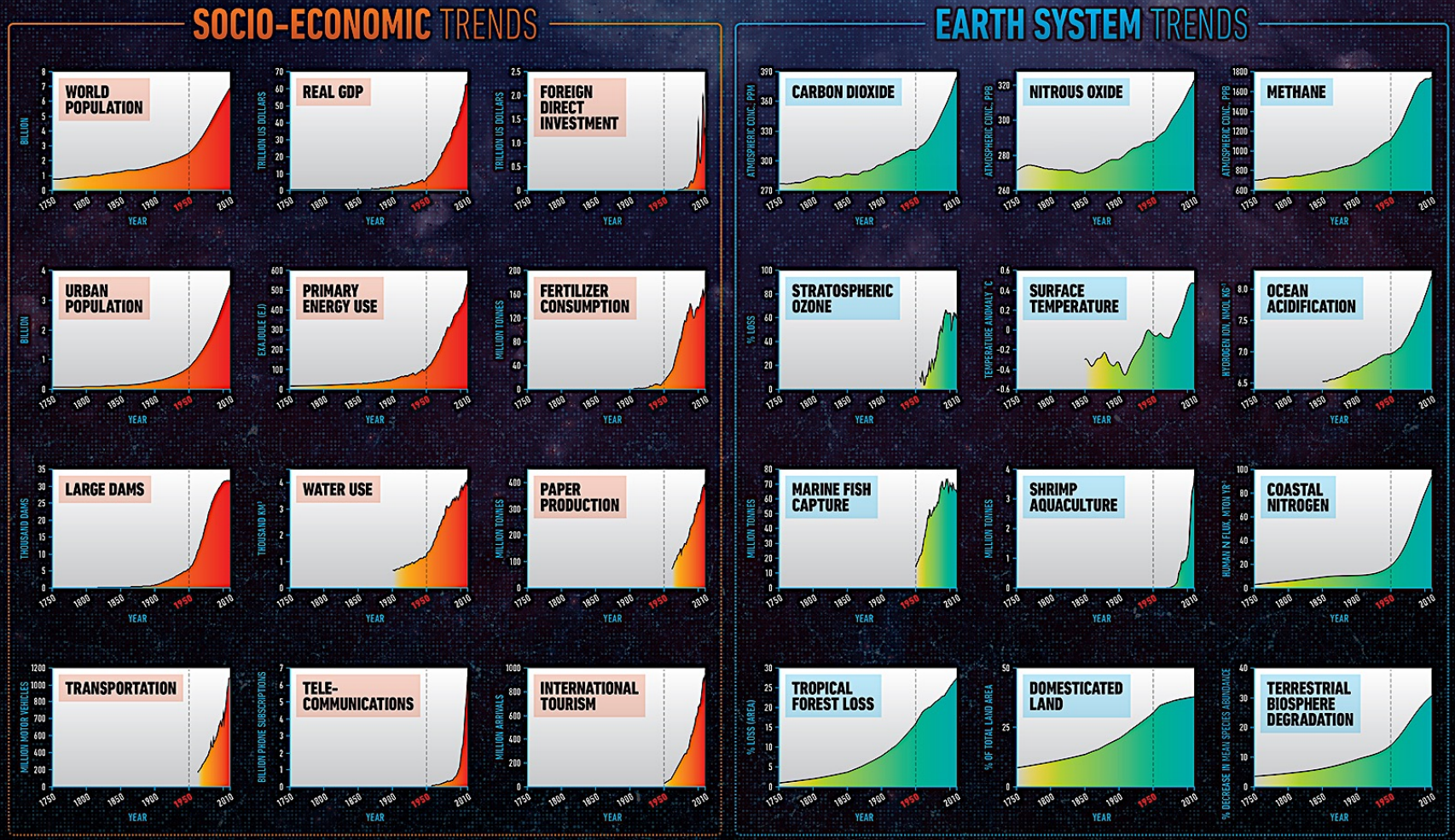
(All fresh surface water: 62 km)

- **<u>All air</u>**

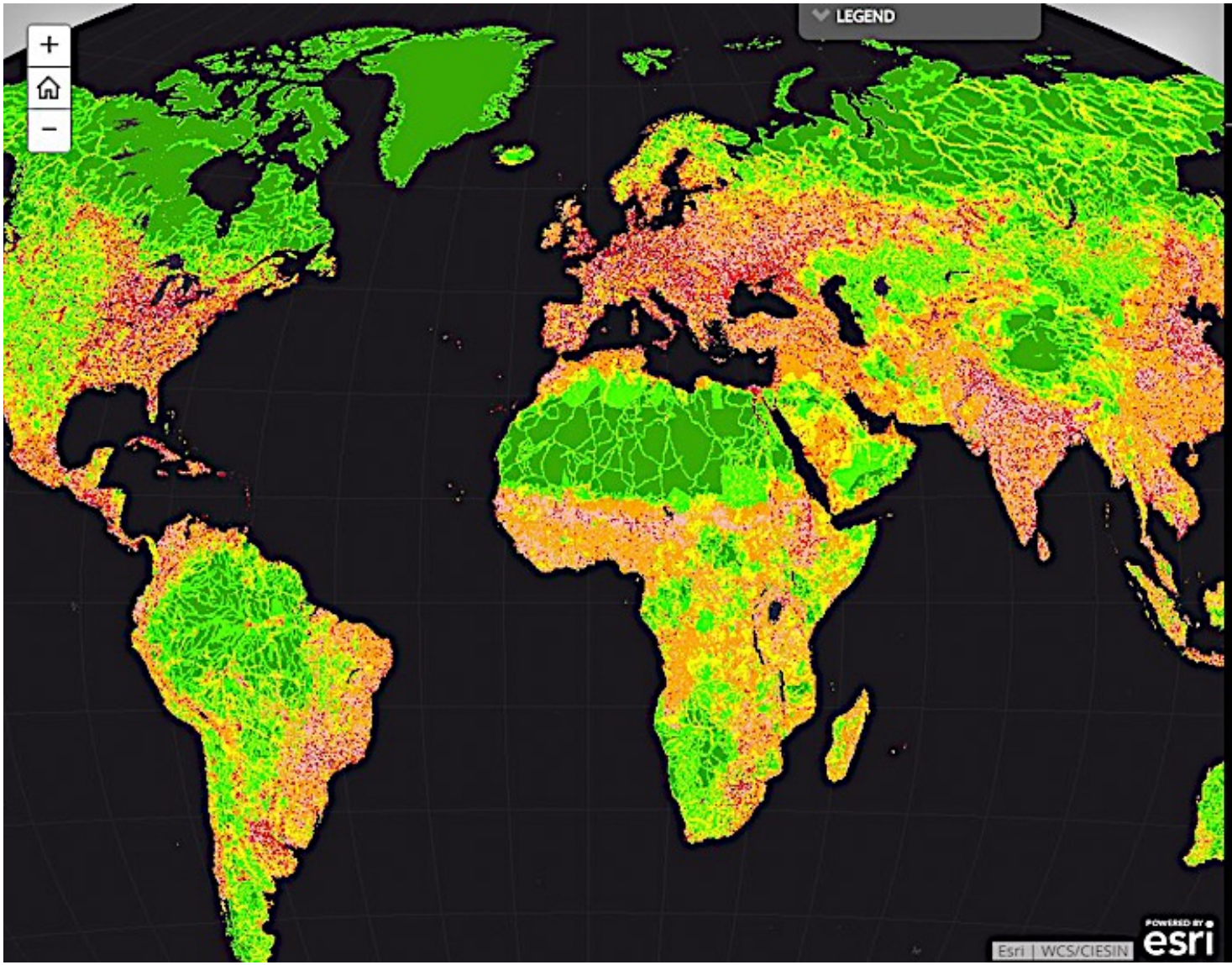
1,999 km across

- *Source: Dr Adam Nieman*

THE GREAT ACCELERATION



REFERENCE: Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig, The Trajectory of the Anthropocene: the Great Acceleration, *The Anthropocene Review*, 16 January 2015.
MAP & DESIGN: Félix Pharand-Deschênes / Globaïa



A story map

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.

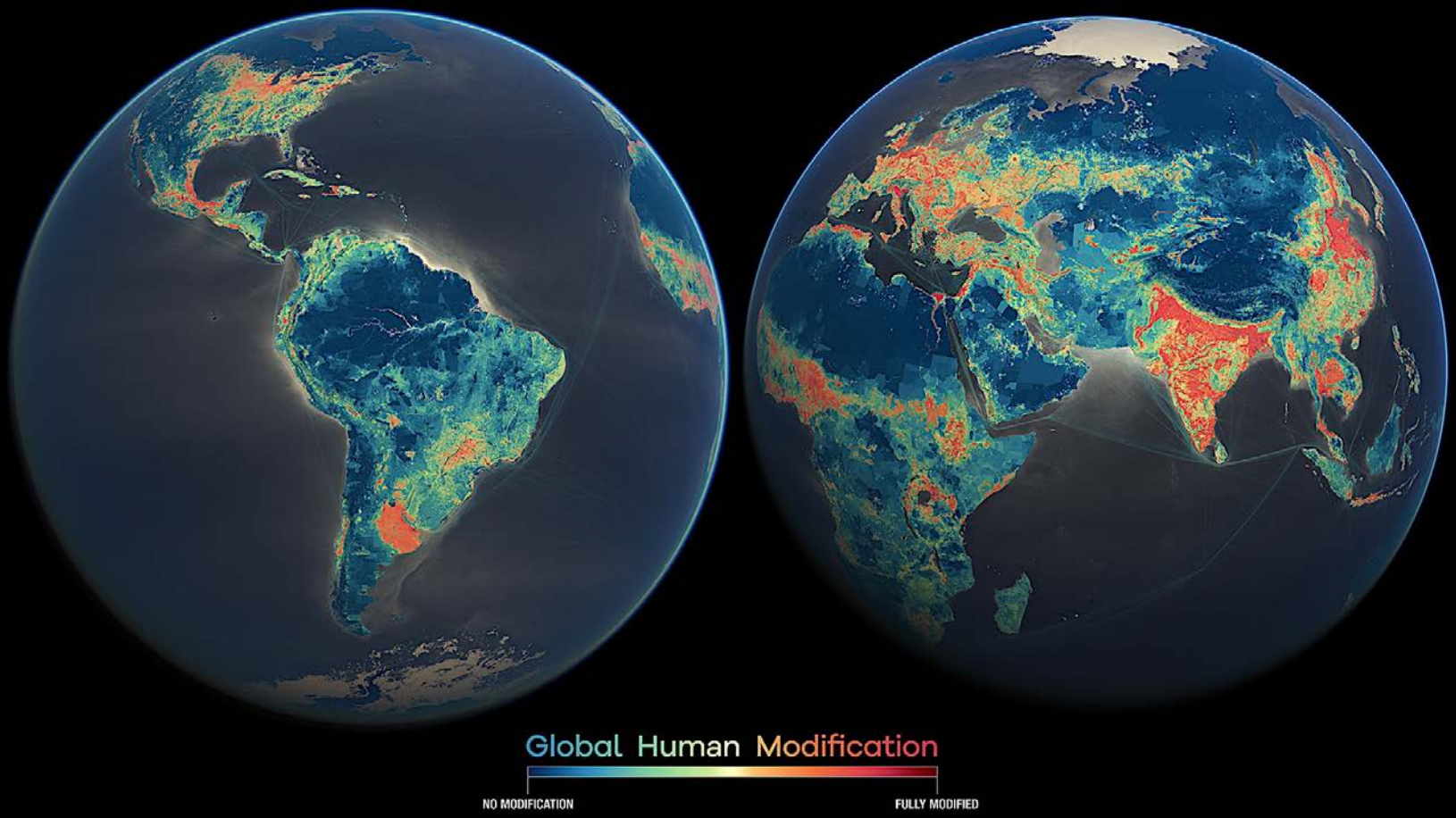
British Columbia, Canada has been transformed by intensive clear-cut logging. Vast woodland tracts in western Canada and the United States have become

The 6th Great Extinction

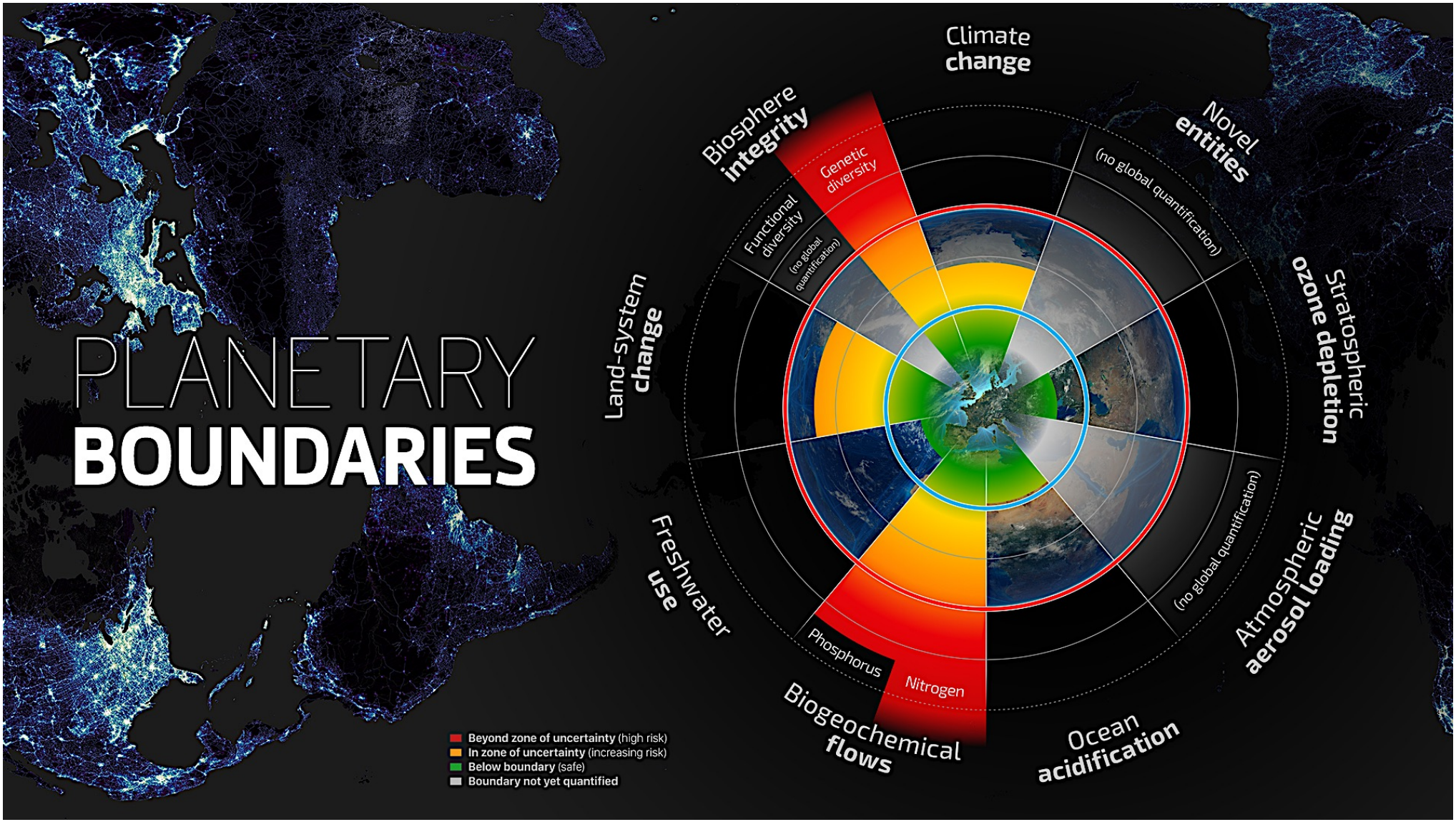
- but the first caused by humans

https://en.wikipedia.org/wiki/The_Sixth_Extinction:_An_Unnatural_History

Planetary Influence of Thermo-Industrial Civilization on Terrestrial Lands



SOURCE Kennedy, CM, Oakleaf JR, Theobald DM, Baruch-Mordo S, Kiesecker J, (2018) Managing the middle: A shift in conservation priorities based on the global human modification gradient. *Global Change Biology* 00:1–16. https://doi.org/10.1111/gcb.14549
DESIGN Globaia

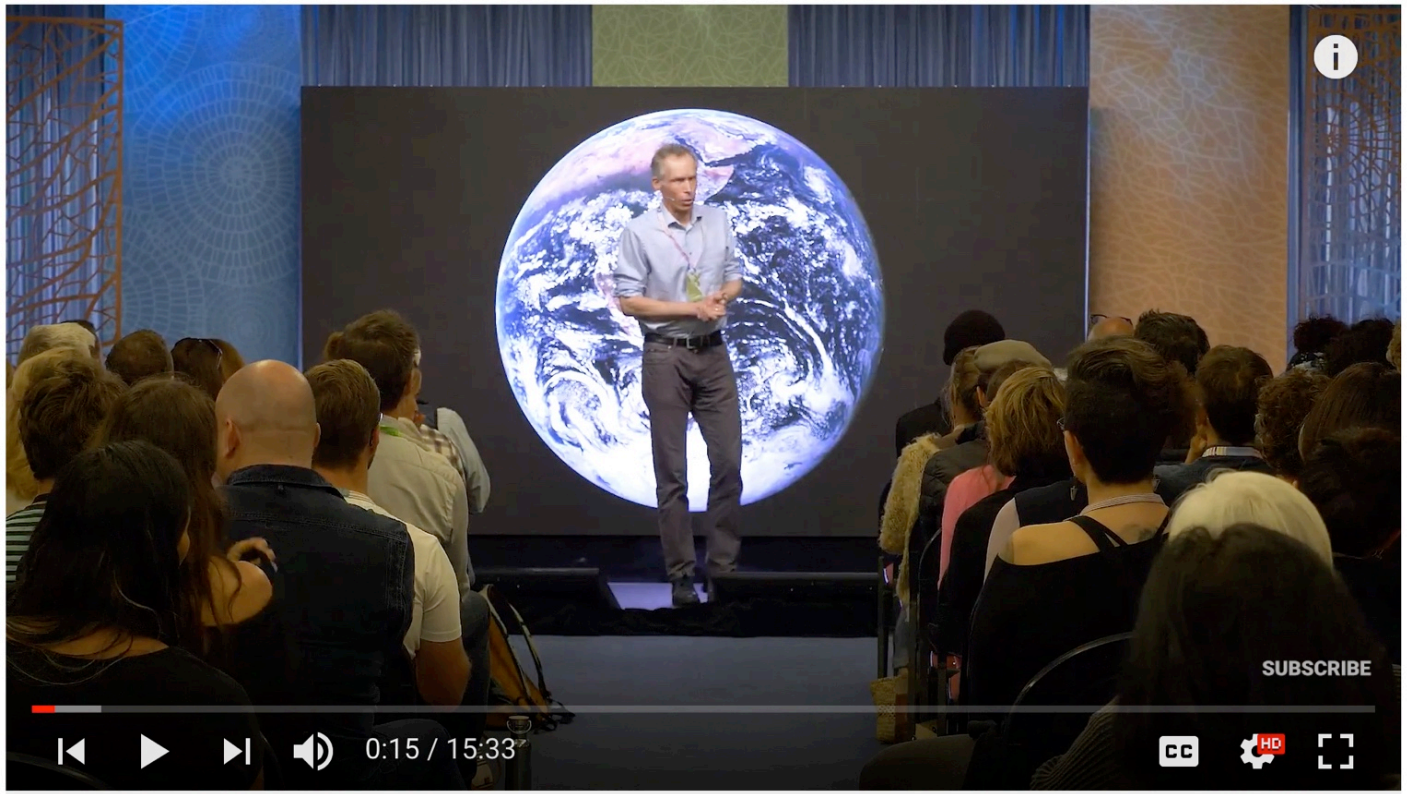

PLANETARY
BOUNDARIES
Climate change
Novel entities
(no global quantification)
Stratospheric ozone depletion
Atmospheric aerosol loading
(no global quantification)
Ocean acidification
Biogeochemical flows
Nitrogen
Phosphorus
Freshwater use
Land-system change
Biosphere integrity
Genetic diversity
Functional diversity
(no global quantification)
Beyond zone of uncertainty (high risk)
In zone of uncertainty (increasing risk)
Below boundary (safe)
Boundary not yet quantified


WELCOME
TO THE Fabulous
ANTHROPOCENE
ERA

Agenda

- Home
- **Revolution**
- Aotearoa

Rockström in NZ - at New Frontiers, April 2018 - session 1

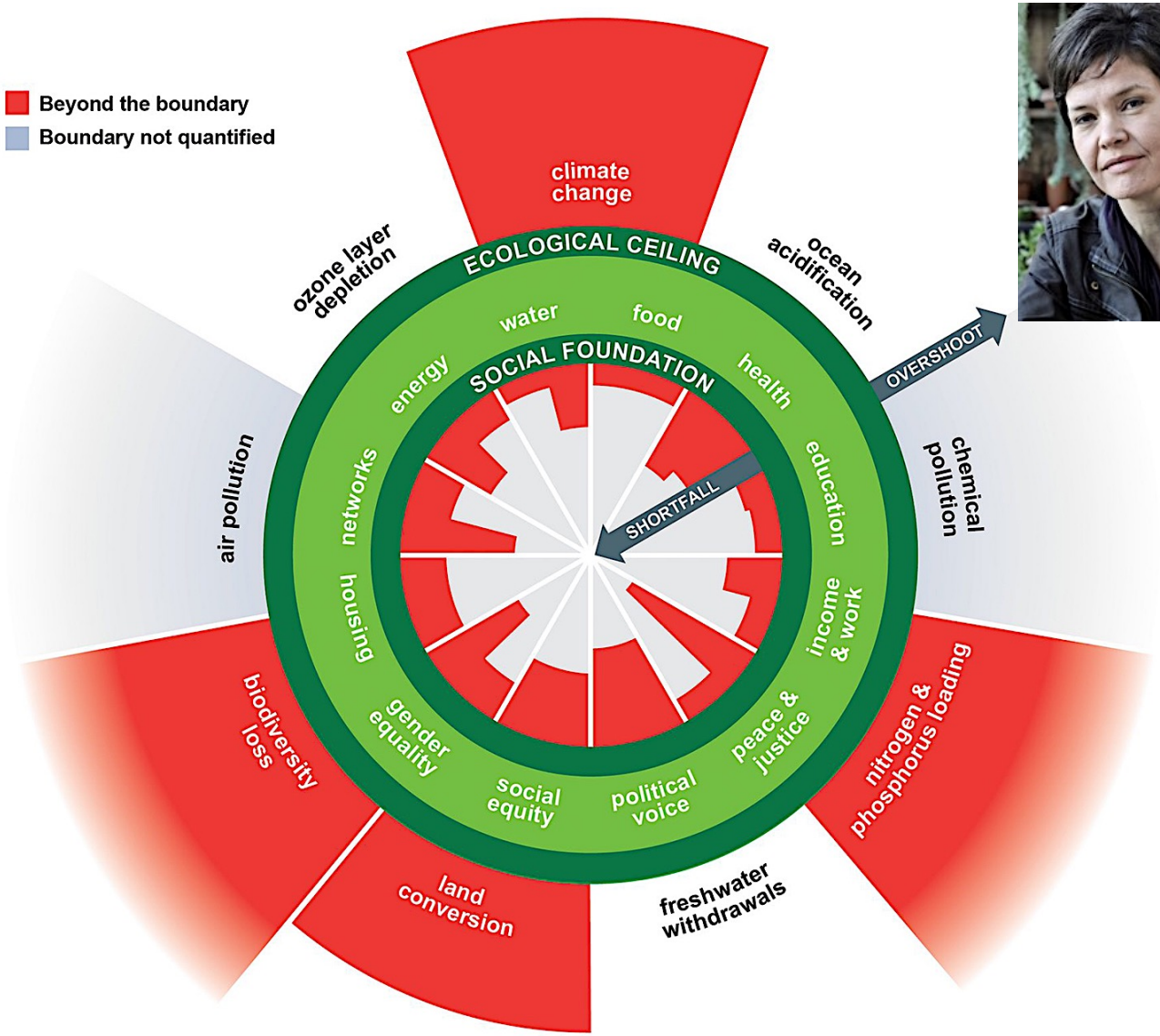


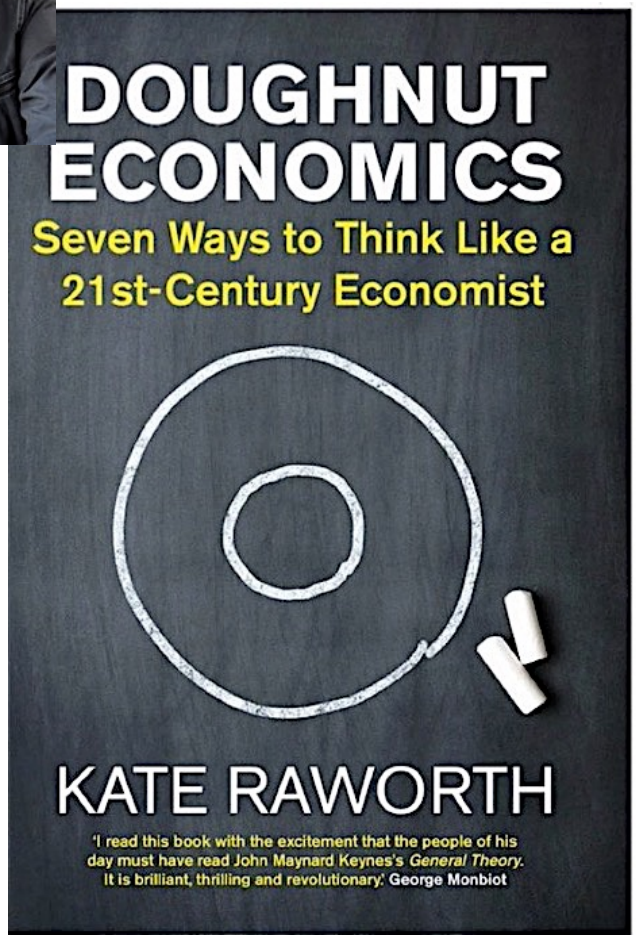
- https://www.youtube.com/watch?v=qLV4wjdac8A&list=PLxTt2Nm5dTv3awnK1ren4BtHNctW_v7zY&index=1

Rockström in NZ - at New Frontiers, April 2018 –session 2

- https://www.youtube.com/watch?v=sA4SnQ6cPR8&index=13&t=0s&list=PLxTt2Nm5dTv3awnK1ren4BtHNctW_v7zY

Some goals to guide our recovery


Beyond the boundary
Boundary not quantified
climate change
ozone layer depletion
ocean acidification
air pollution
chemical pollution
biodiversity loss
nitrogen & phosphorus loading
land conversion
freshwater withdrawals
ECOLOGICAL CEILING
SOCIAL FOUNDATION
OVERSHOOT
SHORTFALL
water
food
health
education
income & work
peace & justice
political voice
social equity
gender equality
housing
networks
energy


DOUGHNUT ECONOMICS
Seven Ways to Think Like a 21st-Century Economist
KATE RAWORTH
'I read this book with the excitement that the people of his day must have read John Maynard Keynes's General Theory. It is brilliant, thrilling and revolutionary.' George Monbiot

Raworth rewrites the OECD's charter

The Aims of the OECD shall be to promote policies designed to…

1960

…achieve the highest sustainable rate of growth and employment and a rising standard of living in member countries.

OECD

2020

…create regenerative and distributive economies that enable humanity to thrive, whether or not they grow.

For 21st century progress, pick your paradigm. Neither is easy, nor proven.

"Today's uber-capitalism demands maximum growth"

(as summed up by Branko Milanovic)

- People are greedy, insatiable & competitive.
- The metric of success is money and everyone wants more of it.
- This can't be changed in any foreseeable future.
- Hence pursuing wellbeing calls for maximizing GDP growth.
- Achieving this depends upon overcoming environmental limits to growth – and, thanks to technology, it can be done.

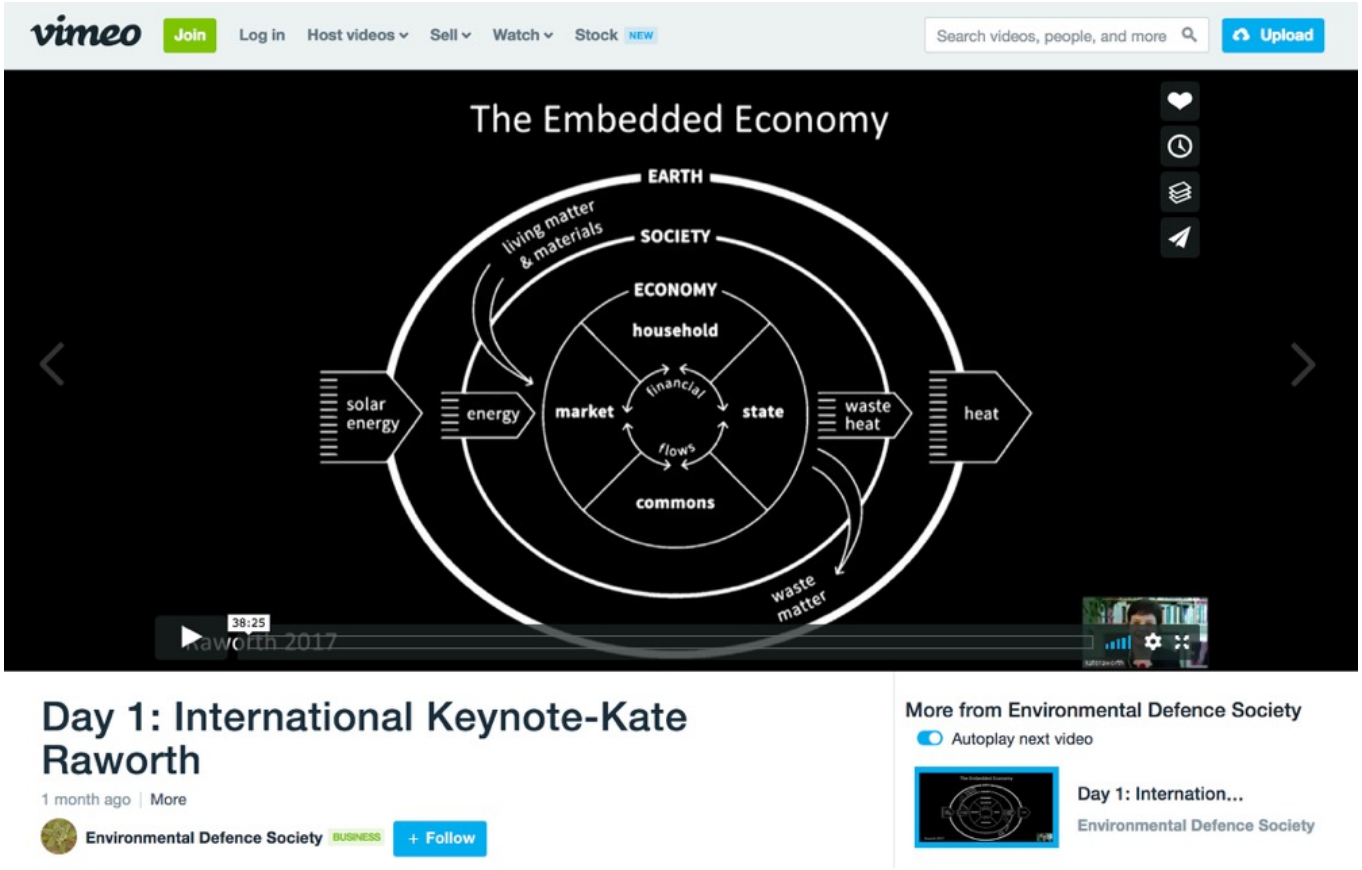
"Tomorrow's thriving future must be growth agnostic"

(as summed up by Kate Raworth)

- People are greedy and generous, competitive and collaborative – and it's possible to nurture human nature.
- The metric of success is to meet the needs of all within the means of the planet (aka get into the Doughnut)
- This is essential for humanity's common future.
- Hence pursuing wellbeing calls for distributive and regenerative economies – with GDP adjusting in response.
- Achieving this depends upon overcoming today's financial, political and social addictions to GDP growth – by no means easy, but it can be done.

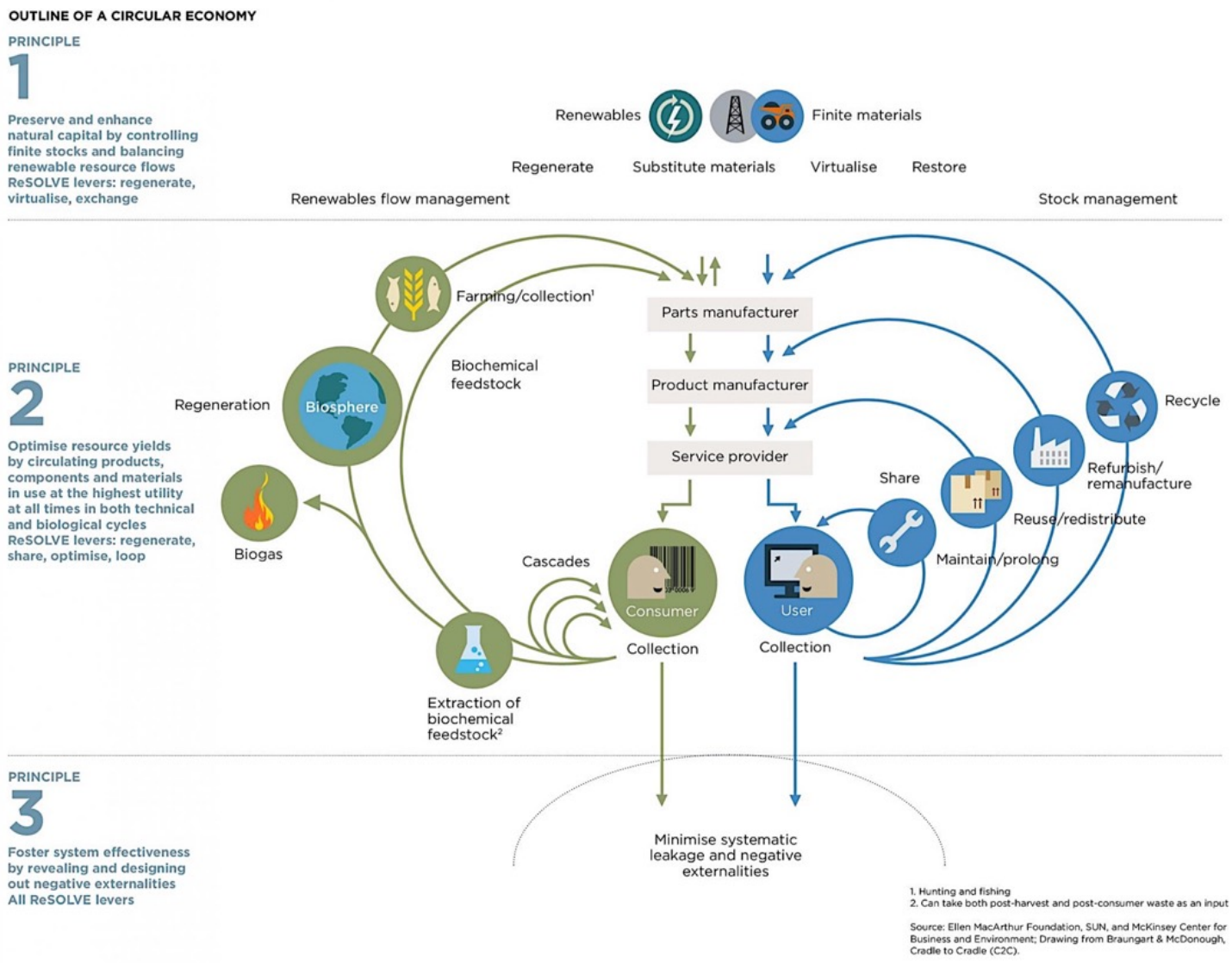
Raworth's first NZ presentation

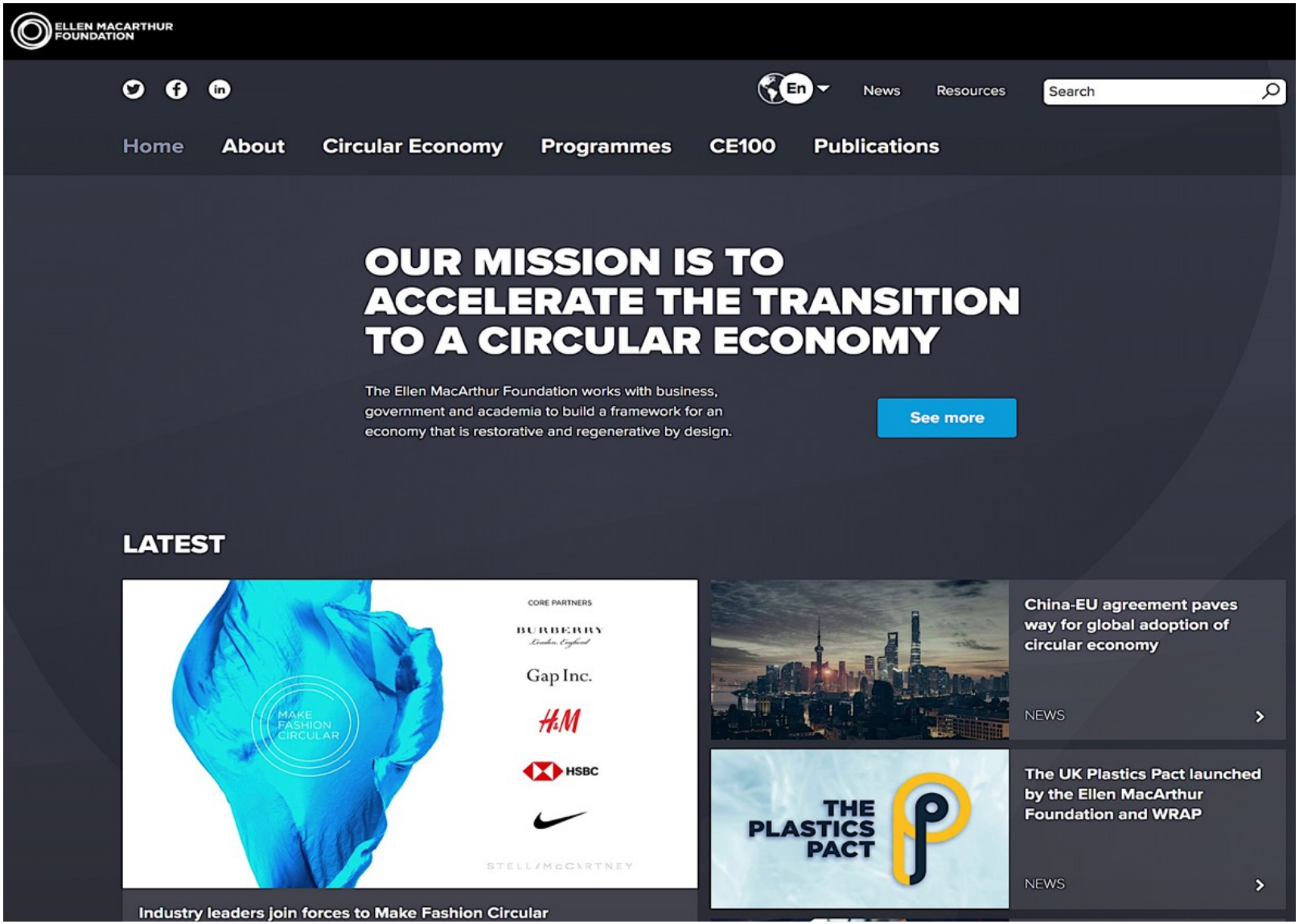
- August 2018, Environmental Defence Society's Conference https://vimeo.com/284104419



Circular economy

- Unmake everything we make
- Reuse all natural and human-made resources
- Maximize resources, minimise pollution
- **Working with nature …not against it**

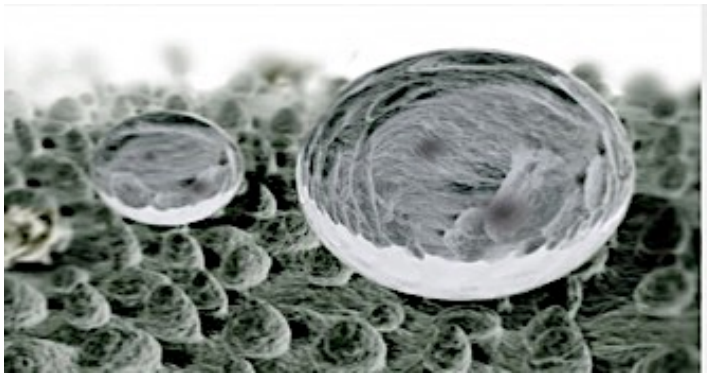




- https://www.ellenmacarthurfoundation.org/

Biomimicry

- We need radical transformation...so all we do works with nature, not against it
- Learning, borrowing, adapting from nature
- ...massive transformation of technology



Cities

World: Cities occupy 3% of the Earth's land

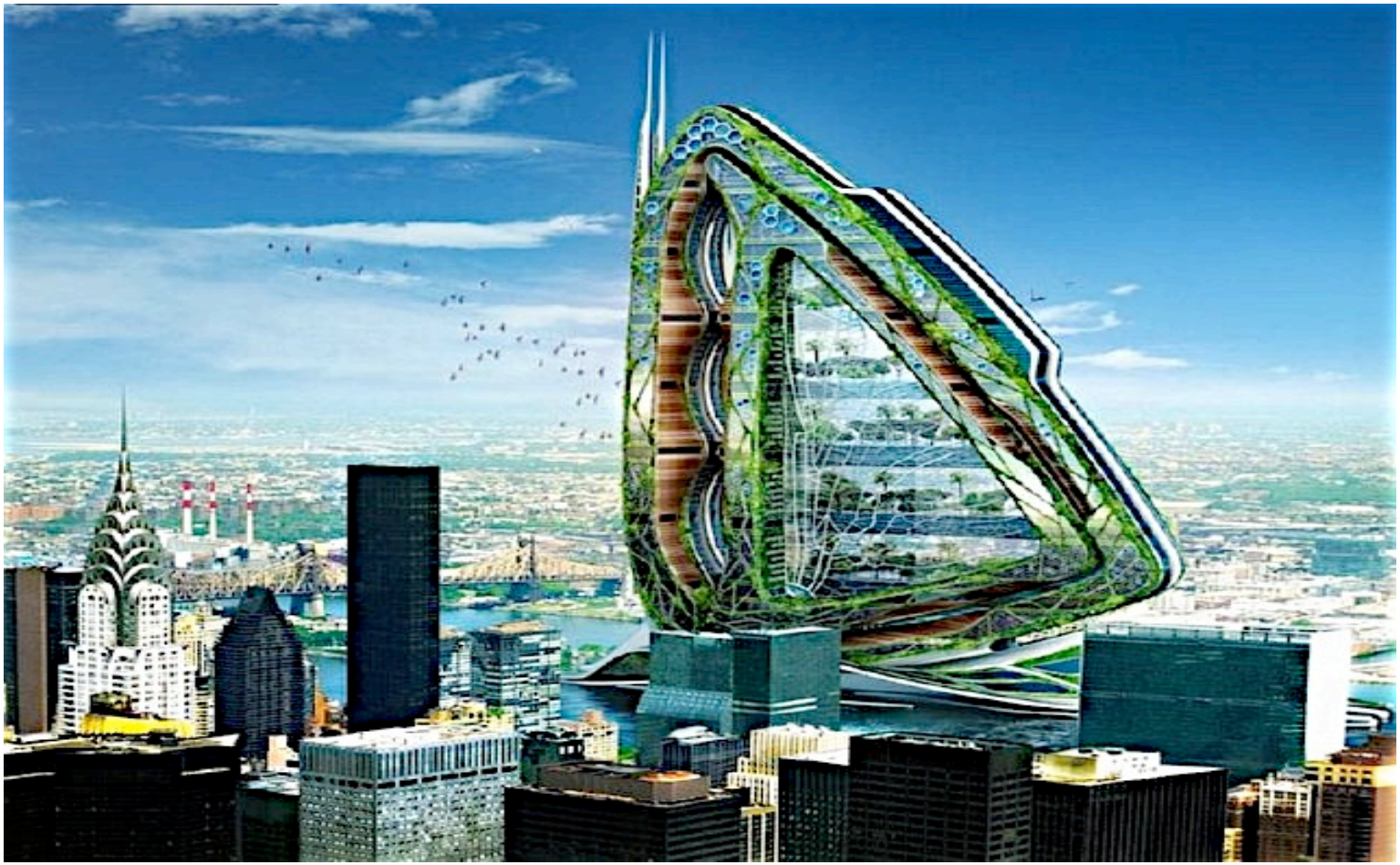
- …but account for:
  - 54% of human population
  - 60-80% of energy consumption
  - 75% of carbon emissions; 75% of waste
  - 40 mega-urban regions = 18% of population, 66% of GDP, 85% of science and tech innovation

- **Aotearoa:** Cities and towns occupy 2% of our land
  - 86% of us live in urban areas
  - We are more urbanised than British, Americans, Canadians, French & Germans etc.

- **…yet we still define ourselves and our nation by our wild and rural parts**

Cities must change fundamentally

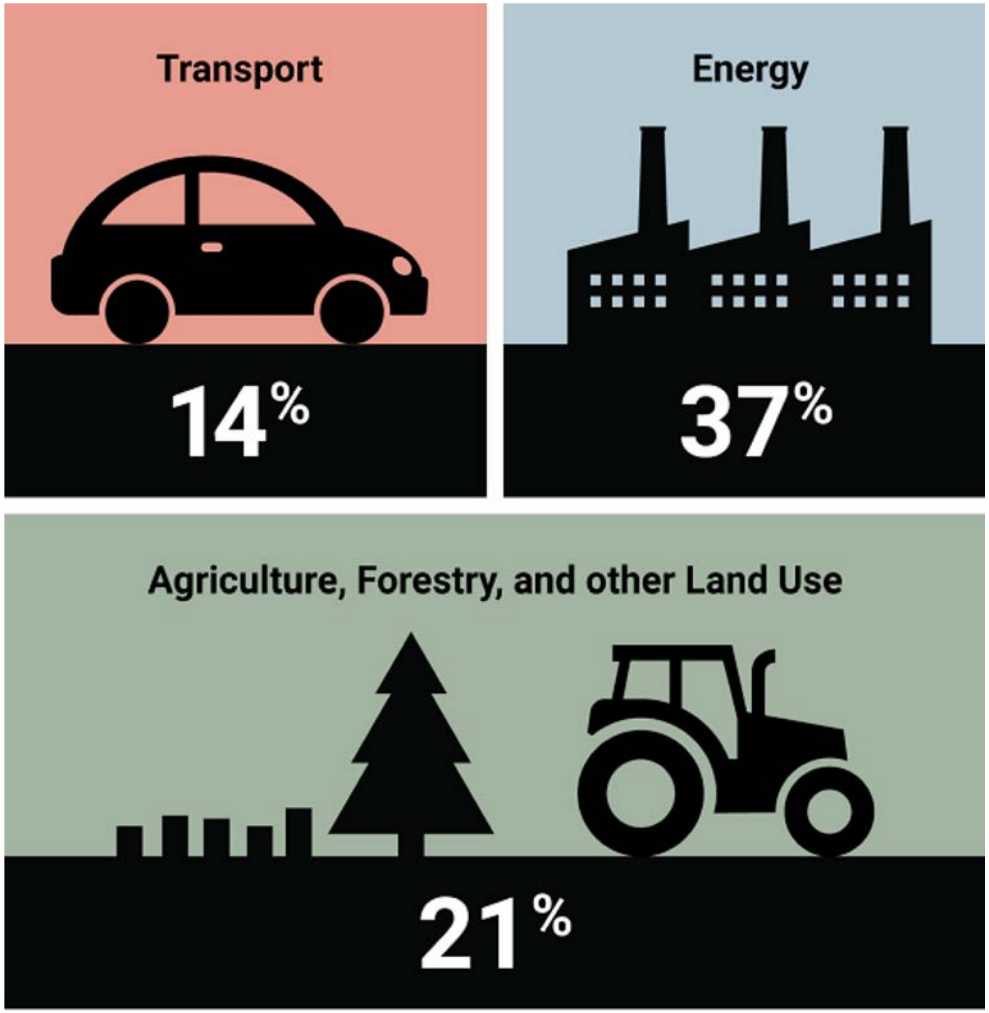
- …to bring nature back into cities
- …making them largely sufficient for energy, food and other resources
- …be delightful, inspiring places to live and work
- …to restore our relationship with the ecosystem



Monumental 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? **…emerging!**



INSTITUTE ON THE ENVIRONMENT
UNIVERSITY OF MINNESOTA
Driven to Discover

Food and Agriculture Organization of the United Nations

DATA SOURCE: TUBIELLO ET AL. 2015, GLOBAL CHANGE BIOLOGY

“Healthy people, healthy planet”

“Food in the Anthropocene represents one of the greatest health and environmental challenges of the 21st century”

EAT–*Lancet* Commission on healthy diets from sustainable food systems

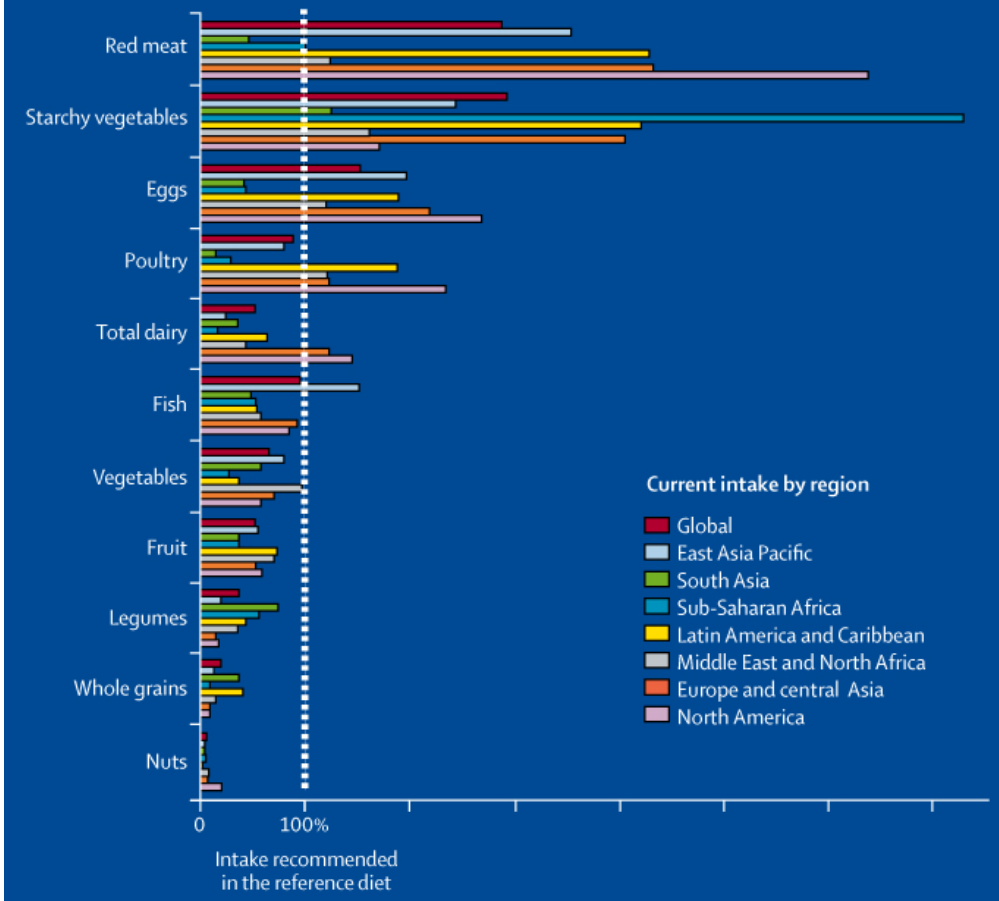
THE LANCET

The best science for better lives

Healthy food, healthy planet

- Commission chose the healthiest diet first
- …then studied its environmental footprint
- …then mapped how we can achieve both

The great food transformation

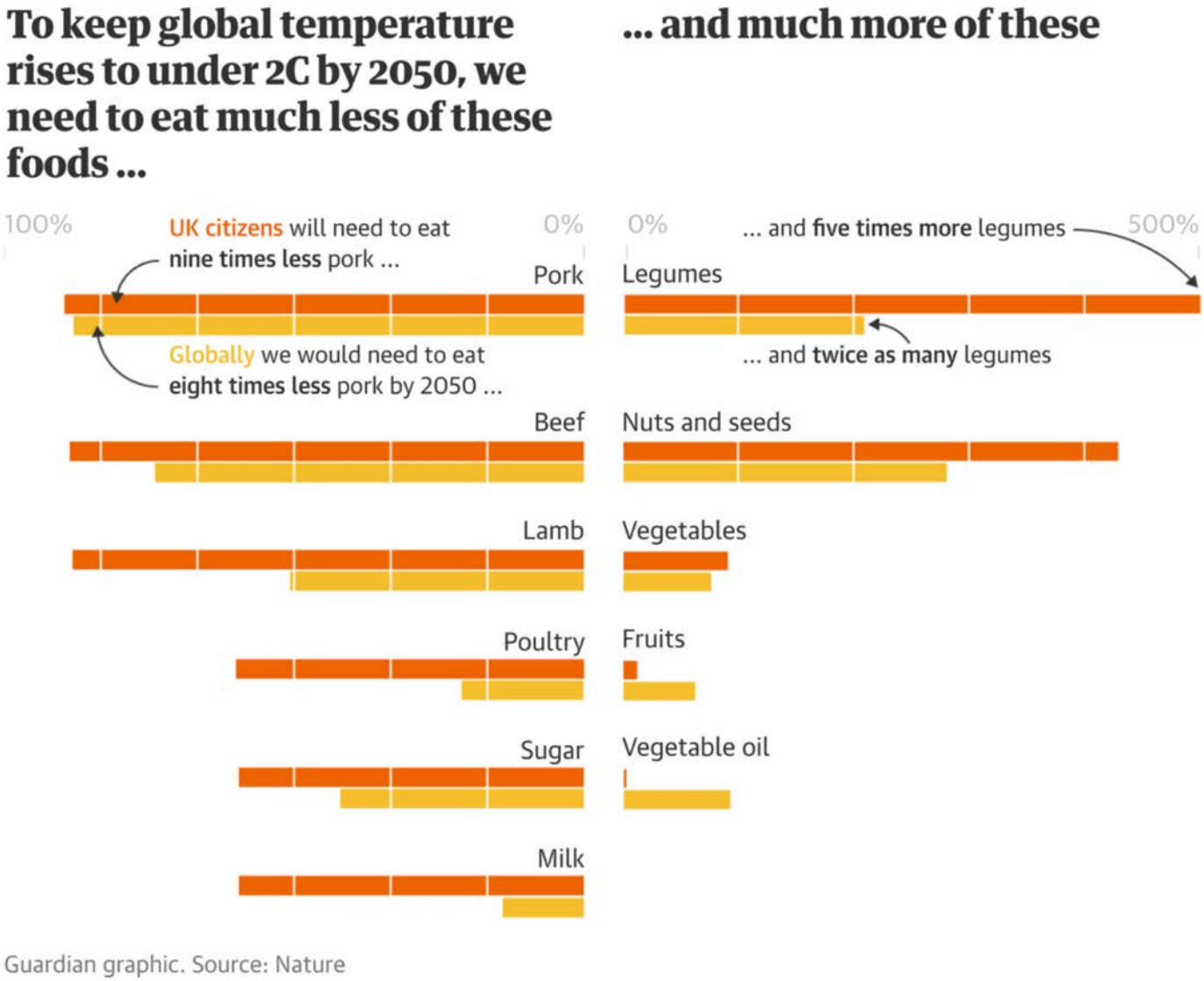


The EAT–*Lancet* Commission defines a reference diet that **meets nutritional requirements, within planetary boundaries** to minimise damage to Earth's systems.

Global adoption of the reference diet by 2050 will require worldwide consumption of red meat and sugar to reduce by more than 50%, and consumption of nuts, fruits, vegetables, and legumes to increase by 100%, accommodating significant regional differences and needs.

Read the Commission:
www.thelancet.com/commissions/EAT

Why horticulture is crucial



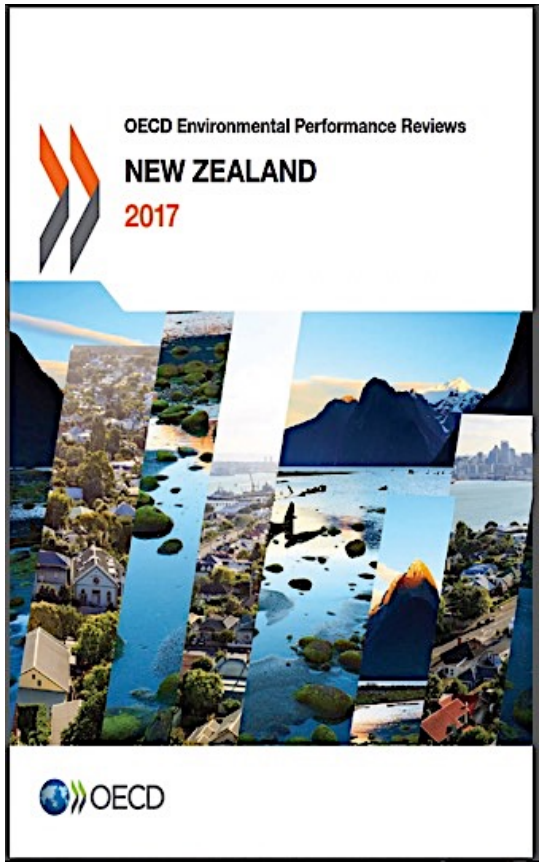
https://www.theguardian.com/environment/2018/oct/10/huge-reduction-in-meat-eating-essential-to-avoid-climate-breakdown

Agenda

- Home
- Revolution
- **Aotearoa**

OECD's verdict

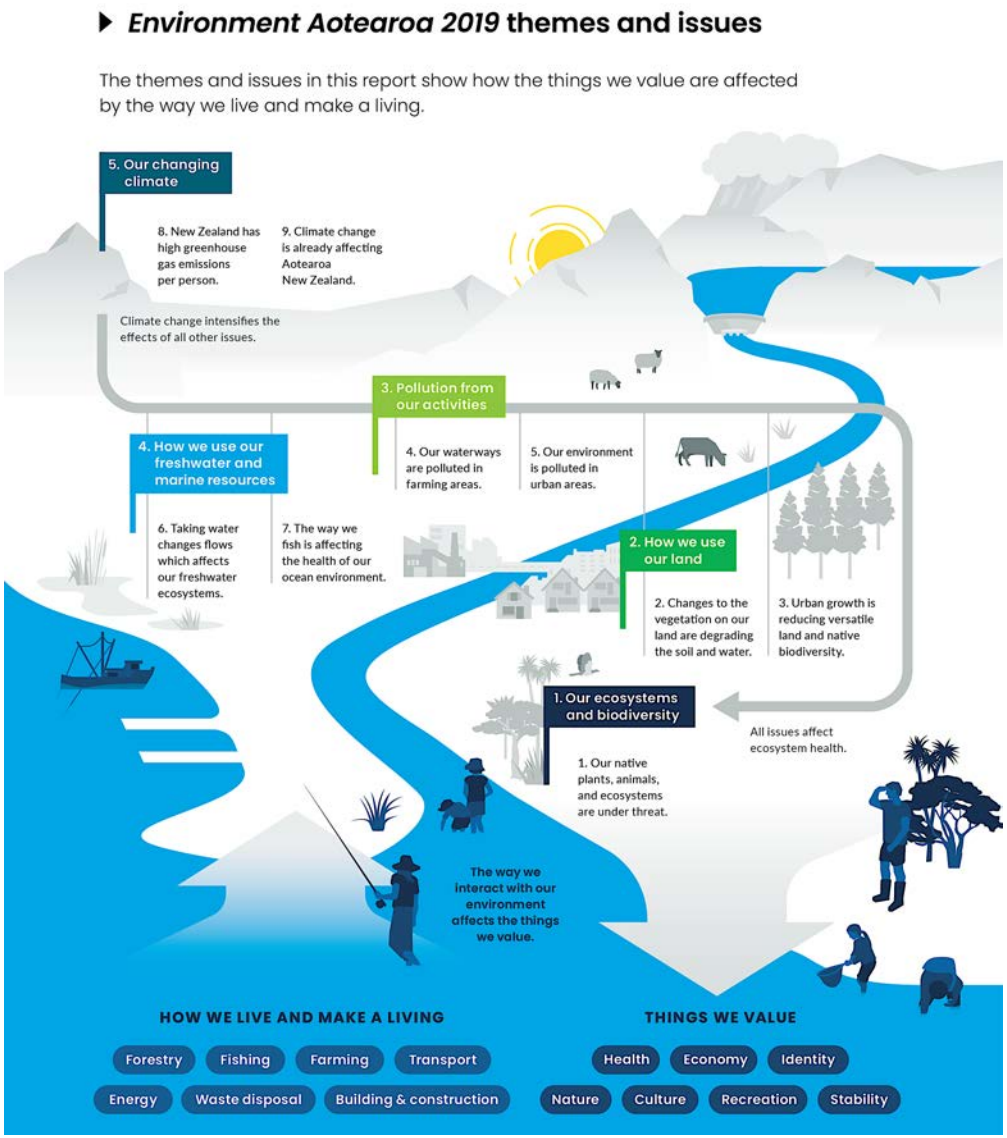
- "New Zealand's growth model...has started to show its environmental limits, with increased GHG emissions, freshwater contamination and threats to biodiversity.
- "Addressing GHG emissions from agriculture, and especially dairy farming, should remain a priority...
- "...the need to further explore the 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."



The damage we're doing

- Environment Aotearoa 2019
- The first comprehensive analysis of the inter-connected ways we're damaging our biosphere

- http://www.mfe.govt.nz/node/24964/



Environment Aotearoa 2019

Theme 1: Our ecosystems and biodiversity
- Issue 1: Our native plants, animals, and ecosystems are under threat

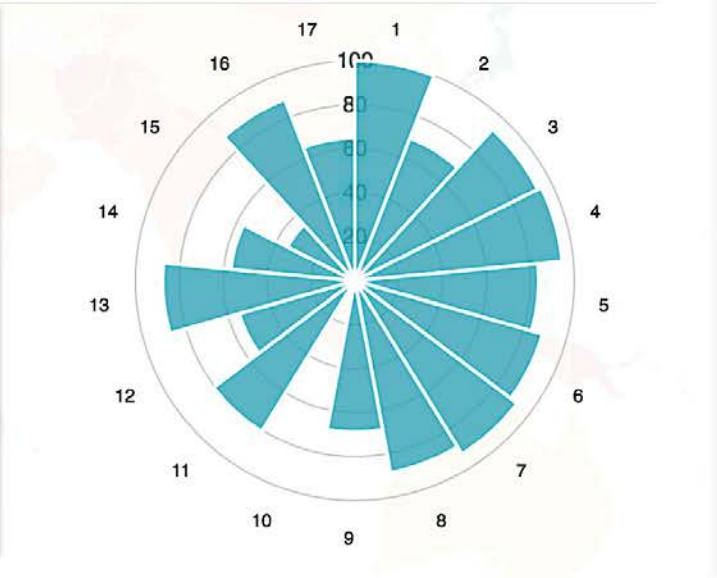
Theme 2: How we use our land
- Issue 2: Changes to the vegetation on our land are degrading the soil and water
- Issue 3: Urban growth is reducing versatile land and native biodiversity

Theme 3: Pollution from our activities
- Issue 4: Our waterways are polluted in farming areas
- Issue 5: Our environment is polluted in urban areas

Theme 4: How we use our freshwater and marine resources
- Issue 6: Taking water changes flows which affects our freshwater ecosystems
- Issue 7: The way we fish is affecting the health of our ocean environment

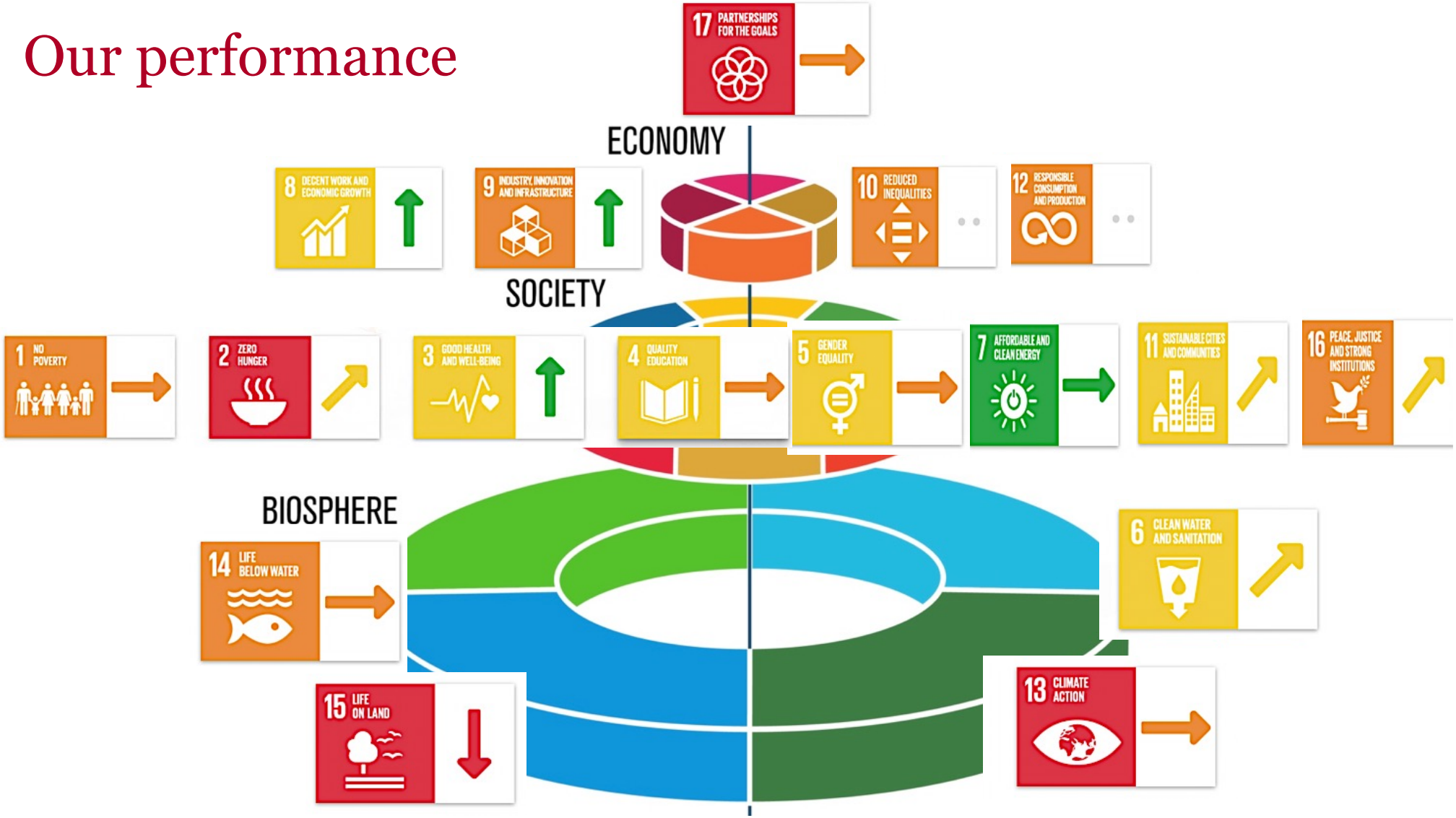
Theme 5: Our changing climate
- Issue 8: New Zealand has high greenhouse gas emissions per person
- Issue 9: Climate change is already affecting Aotearoa New Zealand

Our score



- https://dashboards.sdgindex.org/#/NZL

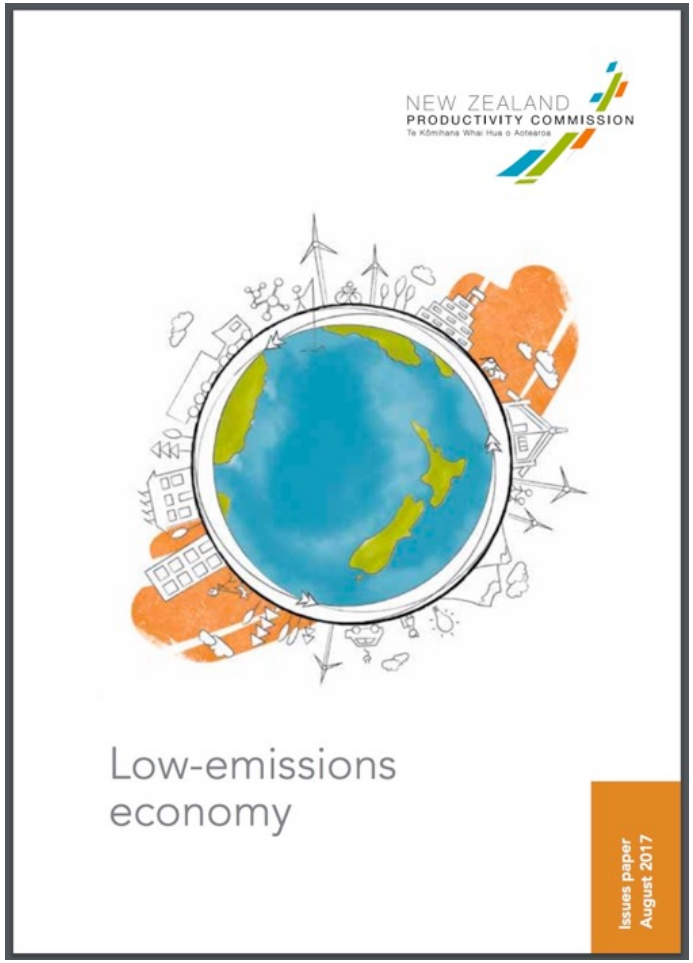
Our performance



“…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 carbon economy, August 2017



Low-emissions economy

New Zealand is well positioned to respond

- New Zealand has a low-emissions electricity system…
- …and there is large scope to increase the supply of clean electricity, enabling electrification in transport and other parts of the economy.
- Expansion in forest planting can give New Zealand valuable adjustment time.
- New Zealand already has the architecture for an emissions pricing system in place.
- New Zealand can provide leadership in developing an effective approach to tackling biogenic methane.

A new approach that treats long- and short-lived gases differently

	Long-lived gases	Short-lived gases
Target	Net-zero, at a minimum, by a specified end date	Stabilised future emissions at a significantly lower level
Pricing system	NZ ETS (including nitrous oxide)	Dual-cap NZ ETS or methane quota system

The challenge

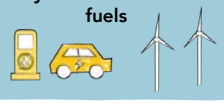
- Climate change is a prime example of the tragedy of the commons, where short-term private incentives swamp the long-term public interest.
- New Zealand is committed to reducing its emissions to help achieve the Paris goal of limiting warming to well below 2°C.
- Meeting this commitment is achievable, but there will be tough challenges.

"Shifting to a low-emissions trajectory will critically depend on political leadership and fortitude. Inertia and resistance to change can be expected…meeting this challenge will likely be futile without broad agreement across the political spectrum on both the need and means to make the transition. (p. 507)"

NEW ZEALAND PRODUCTIVITY COMMISSION
Te Kōmihana Whai Hua o Aotearoa

Three shifts to achieve a low-emissions economy

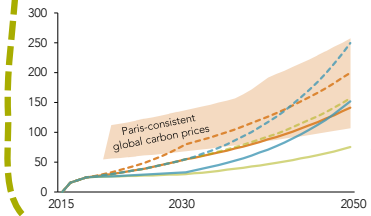
Transition from fossil fuels to electricity and other low-emission fuels



Substantial afforestation

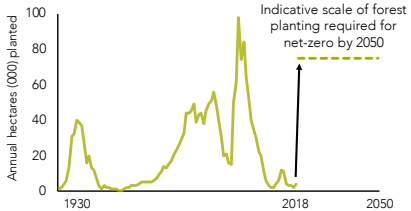
Changes to the structure and methods of agricultural production

Emissions prices are a critical motivator of change



Prices need to rise considerably to generate action. Modelling suggests at least $75 per tonne and over $200 for some scenarios by 2050. Prices are comparable with what's required in other developed economies.

Sustained afforestation will need to exceed past rates



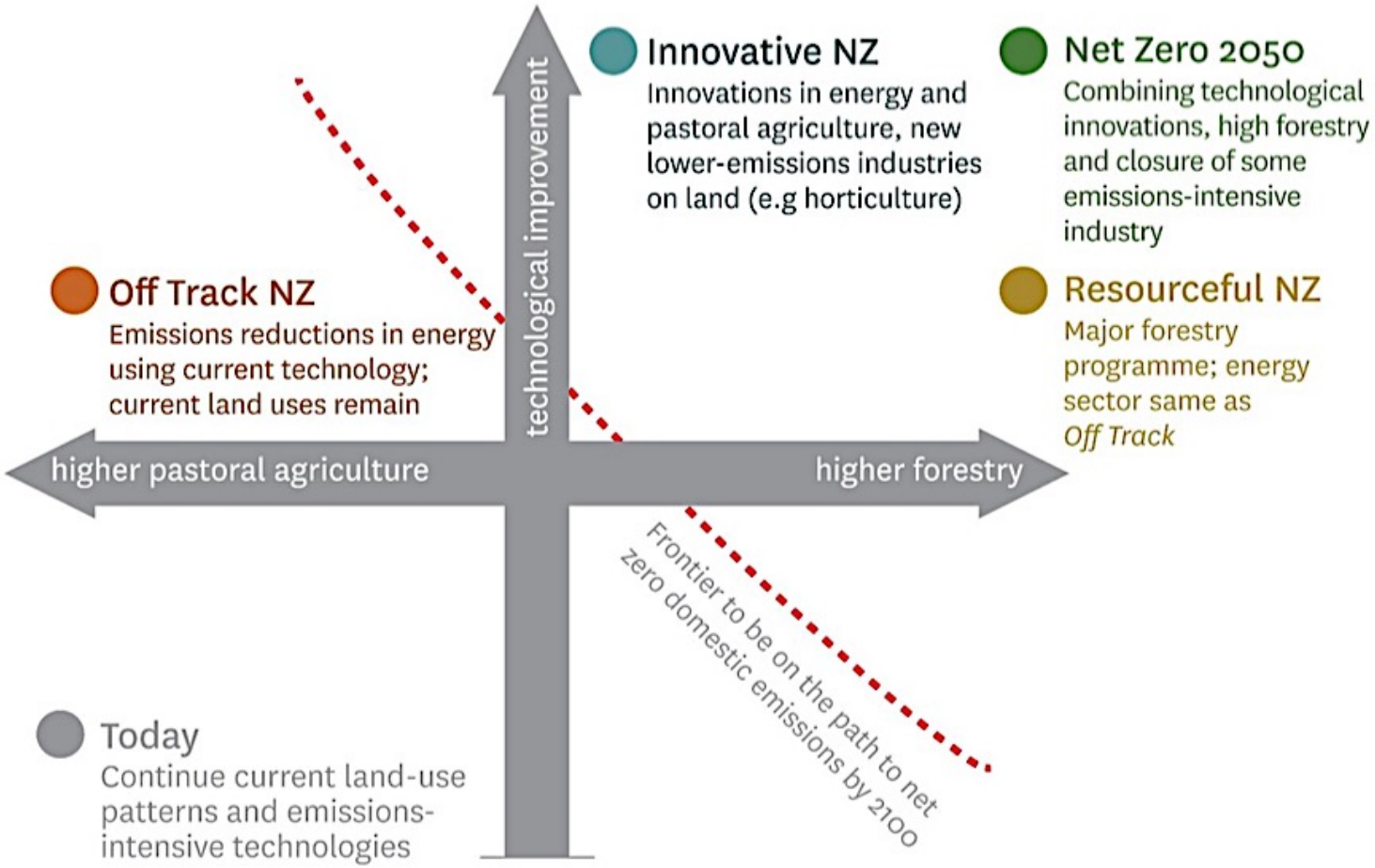
Immediate priorities for Government

1. Reform the NZ ETS (introduce multi-year quantity caps, establish a new market agency) and address biogenic methane in a pricing system.
2. Set in place laws and institutions, including legislated targets, a system of emissions budgets and an independent Climate Change Commission.
3. Devote significantly more resources to low-emissions innovation to lower the future costs of reducing emissions.
4. Prioritise policies to avoid high emissions lock-in (eg, feebate scheme for light vehicles and limits on installing fossil-fuel powered heating systems)
5. Amend electricity system regulation to facilitate the expansion of low-emissions electricity and reduce barriers to innovation and new services
6. Take an active approach to accelerating forest planting (including native species)

Important insights for the transition ahead

- The transition will be long and involve change and uncertainty. Stable and credible policy (with a broad political consensus) is critical to overcome short-term thinking.
- Strong early action is justified. Delaying action limits options in the future and could make the transition much more abrupt and costly.
- Relying heavily on forestry creates challenges in the long term. Forestry buys valuable time. But ongoing progress in reducing gross emissions is necessary up to and beyond 2050.
- Innovation is core to the transition (and can lead to wider productivity benefits).
- In addition to the benefit and tax credit system, other policies may be needed to support households disadvantaged by the transition. Transport costs for low-income households may be a particular pinch point.
- Successful and productive economies handle change well – improving wider productivity performance will make the transition more beneficial and less disruptive for New Zealanders.

Figure 1. **Scenarios differ by the level of technological progress and land-use patterns**



Source: *Vivid Economics*

We're all in this together

- Achieving sustainable growth and ecosystem restoration is a huge challenge for all of us across New Zealand (…as everywhere in the world)
- We all need to play our part…and to help each other play our part

Just one of our urban challenges

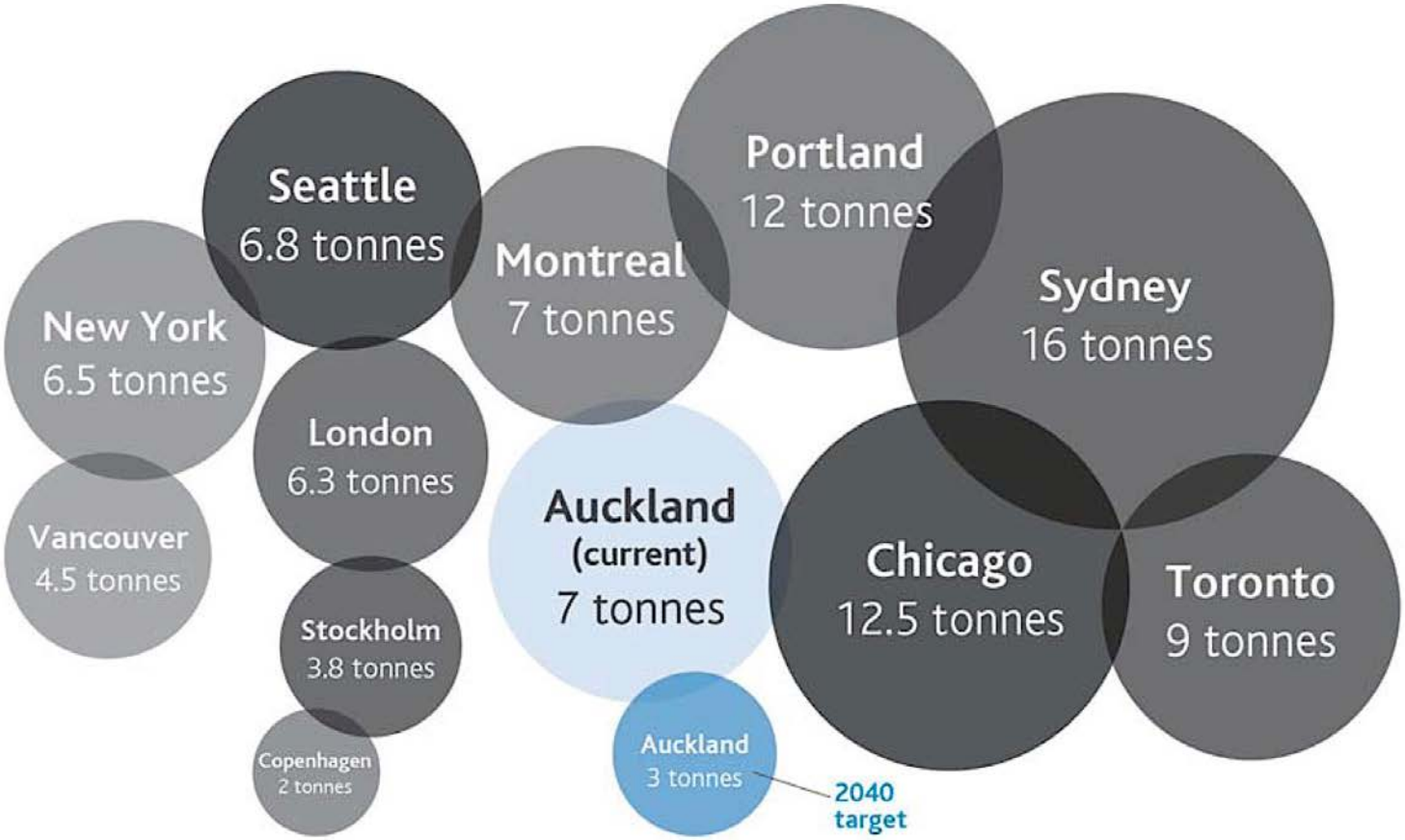
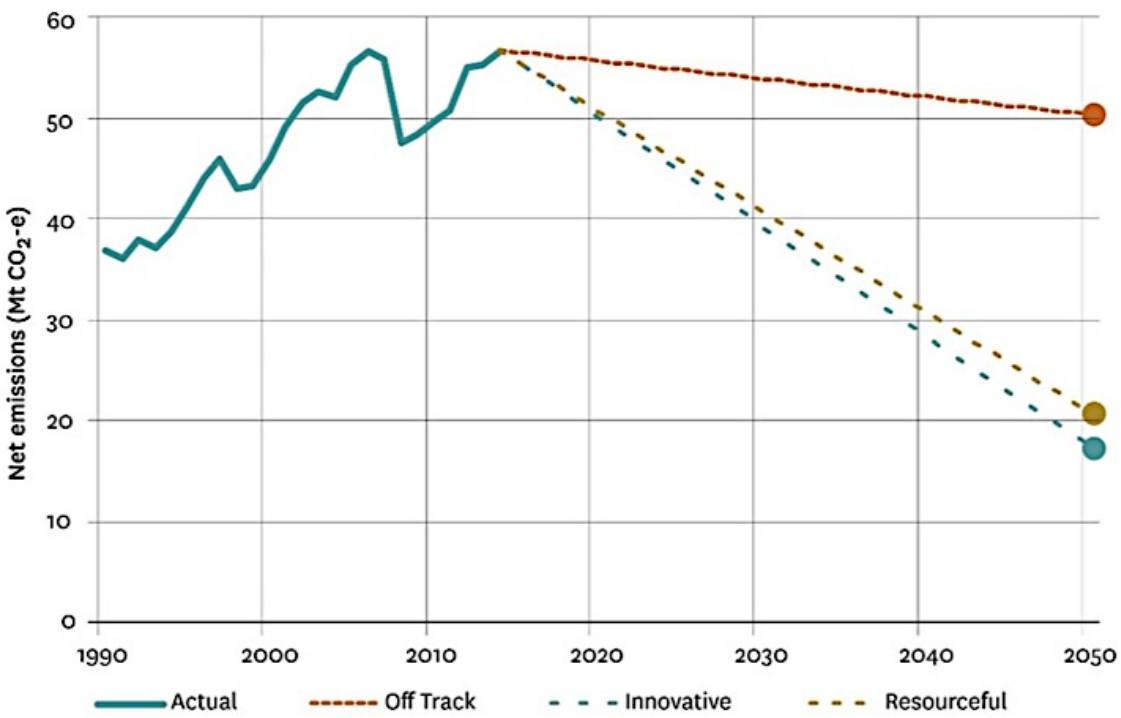


Figure 2.4 A global comparison of **Auckland's emissions per person (Tonnes of CO_2e per person)**

Our sustainable food and agricultural revolution

- These massive environmental, consumer and technology drivers will transform NZ farms and food production…
- …they will become far more diversified, sustainable and profitable
- …many will still farm animals, but fewer and far more sustainably

Figure 2. **Changed land-use patterns, such as in Resourceful or Innovative New Zealand, are required to be on the path to net zero domestic emissions**



Source: *Vivid Economics*

Zero Carbon Act

- A stable, all-party, long-term legislative framework to:
  - Set ambitious long-term carbon reduction goals
  - Create independent climate commission to set carbon budgets, measure progress
  - Pioneered by UK in 2008, decoupled emissions from growth
  - Followed by 20+ jurisdictions…led here by Generation Zero

CLIMATE LEADERS COALITION

ON A MISSION TO REDUCE EMISSIONS IN NEW ZEALAND

ABOUT | WHO | ACTIONS

NEWS & RESOURCES | SIGN UP

Latest News

- Spark moving to plug in hybrid EVs (story on page 20)
  18 Mar 2019
- Big business sets up decarbonisation funds
  18 Mar 2019
- Ricoh joins the Climate Leaders Coalition
  18 Mar 2019

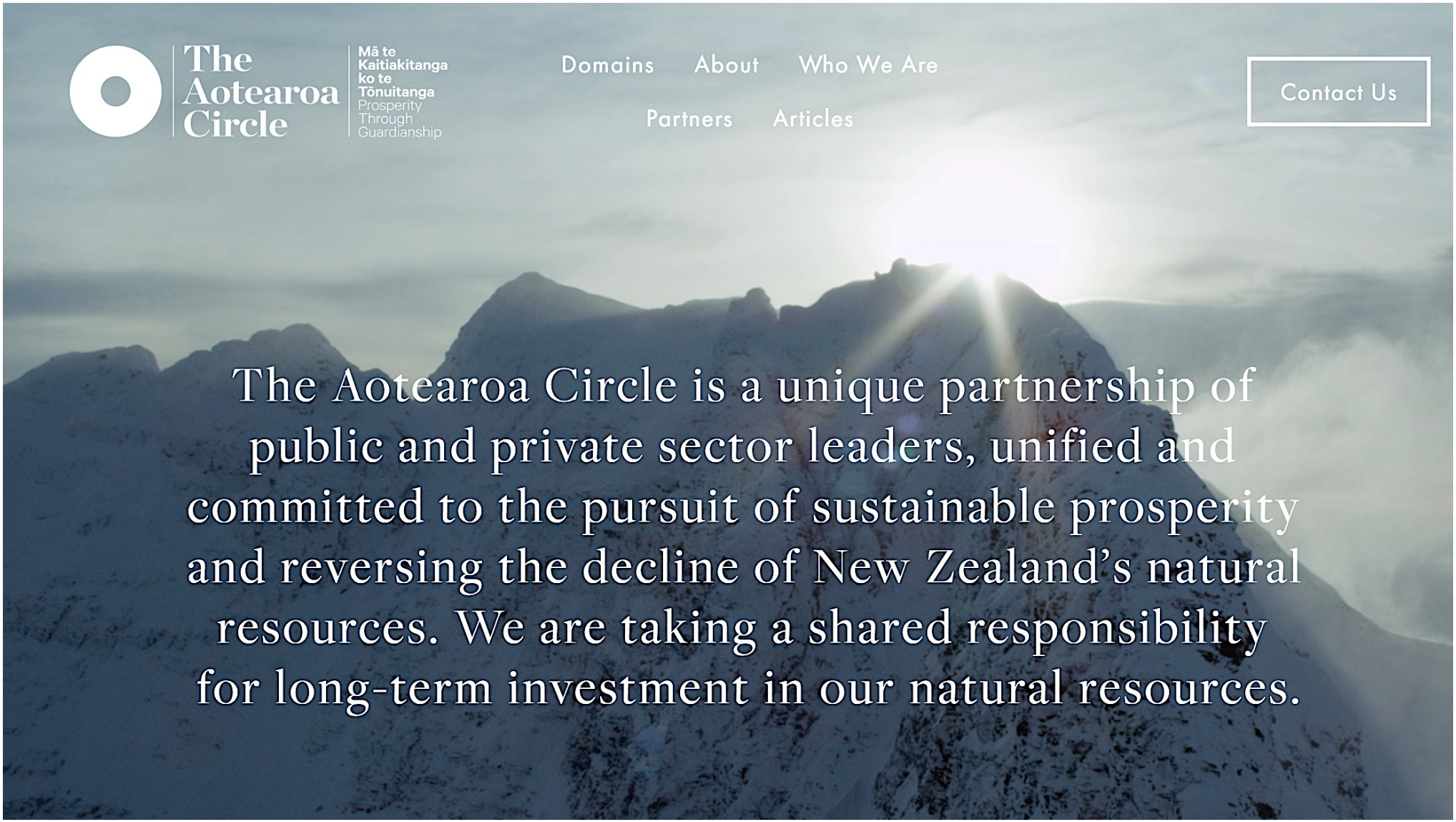
82

Organisations have joined the Climate Leaders Coalition

JOIN THEM

Case Studies

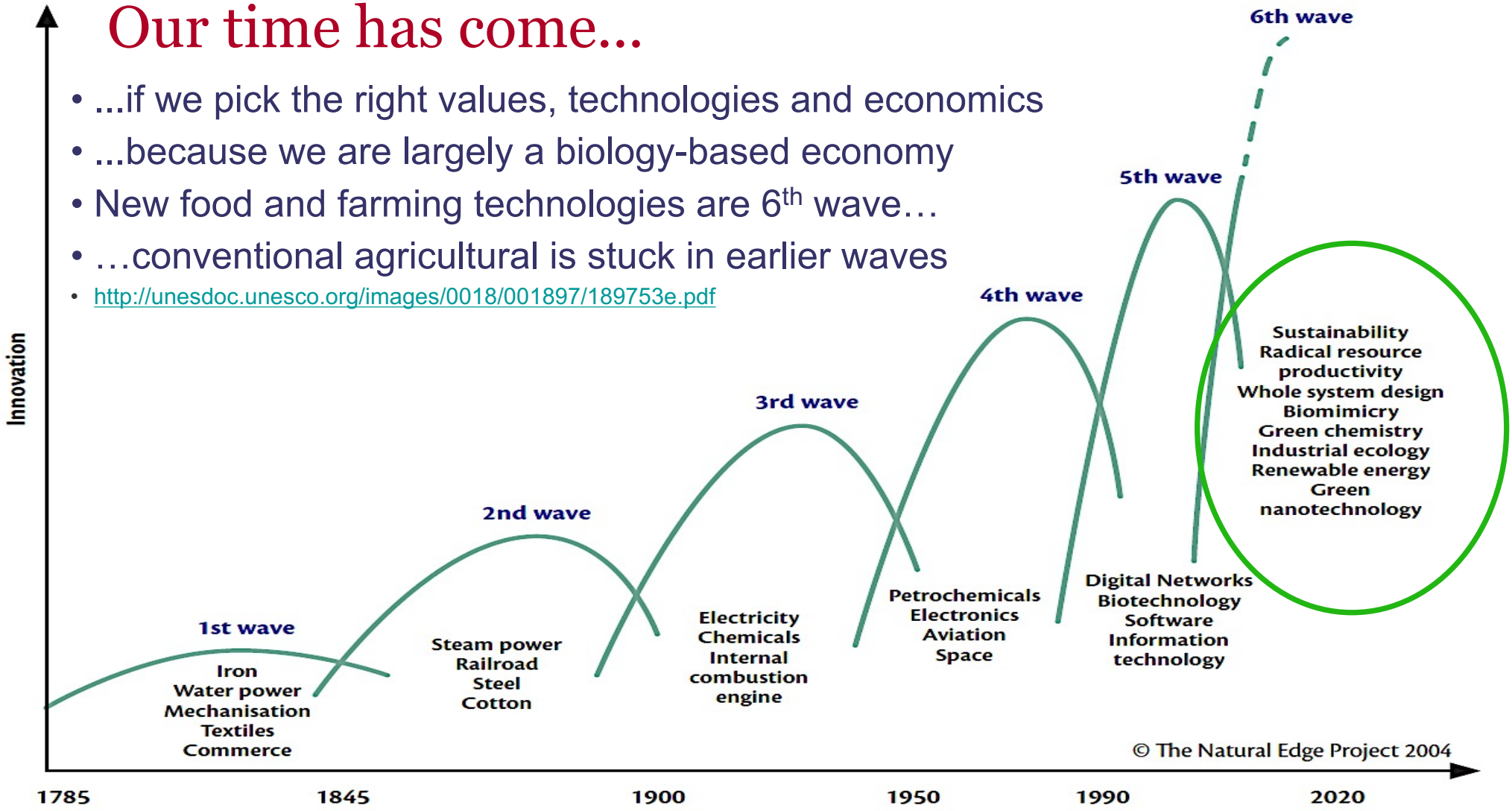
- Meridian case study - Electrifying your fleet
  18 Feb 2019
- CarboNZero case study - The Warehouse Group
  18 Feb 2019
- 3R - a carboNZero case study
  11 Feb 2019


The Aotearoa Circle
Mā te Kaitiakitanga ko te Tōnuitanga
Prosperity Through Guardianship
Domains
About
Who We Are
Partners
Articles
Contact Us
The Aotearoa Circle is a unique partnership of public and private sector leaders, unified and committed to the pursuit of sustainable prosperity and reversing the decline of New Zealand's natural resources. We are taking a shared responsibility for long-term investment in our natural resources.

- Air New Zealand
- Auckland Airport
- Auckland Council
- Department of Conservation
- Designworks
- EnviroNZ
- Fonterra
- J. Walter Thompson
- Land Information NZ
- Manaaki Whenua
- Mercury
- Ministry of Business, Innovation and Employment
- Ministry for the Environment
- Ministry for Primary Industries
- Ministry of Transport
- New Zealand Post
- New Zealand Trade and Enterprise
- Sanford
- Silver Fern Farms
- Spark
- Synlait
- Te Puni Kokiri
- Orion Energy
- Vector
- Villa Maria
- Wakatu Incorporation
- Westpac

Our time has come…

- …if we pick the right values, technologies and economics
- …because we are largely a biology-based economy
- New food and farming technologies are 6th wave…
- …conventional agricultural is stuck in earlier waves
- http://unesdoc.unesco.org/images/0018/001897/189753e.pdf



Being true to ourselves

- In a fast homogenising world in which one country or one product looks ever-more like its competitors, it is utterly crucial that we are true to ourselves

- We have substantial competitive advantages as a people and a country down here in the South Pacific

- We have, and can produce, what many people want…but others can't deliver with quite the same qualities and attributes we can

- For example, Living Buildings are ones that meet the very demanding design and performance disciplines of being self-sufficient for electricity and water

- Tuhoe built the first Living Building in NZ…it is a very beautiful place that is true to them and their needs and hopes

- It is a Living Building that is pure Aotearoa NZ…it looks nothing like the others around the world

Ngāi Tūhoe's Te Kura Whare

Community

- Issues are increasingly global…solutions are increasingly local
- ...to achieve an unprecedented speed, scale and complexity of change

- Solutions require very strong, learning communities…some attributes:
  - Common sense
  - Common purpose
  - Common wealth

- Places where individuals are valued, helped, encouraged…
- …in return, we all participate, change

- We each can only do our infinitesimally small part…
- …but if an infinitely largely number of do so, we can change the world

Four ecosystem crises our survival depends on

- Workshop, today, 11.10am - 12.40pm
- Climate change – Kahu Kutia
- Land, water and biodiversity – Jan Hania
- Oceans – Prof Simon Thrush
- Cities and towns – Rod Oram

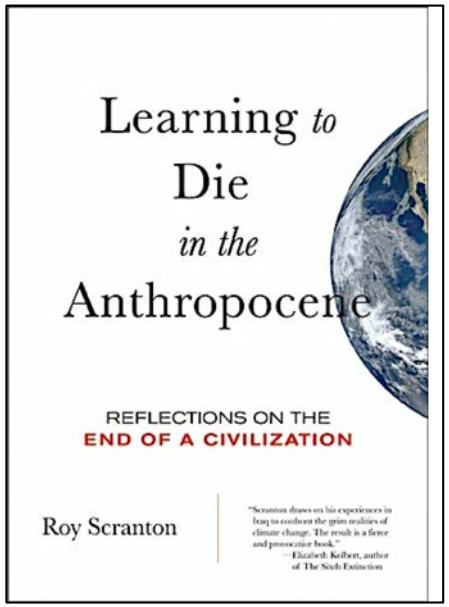
Civilisation

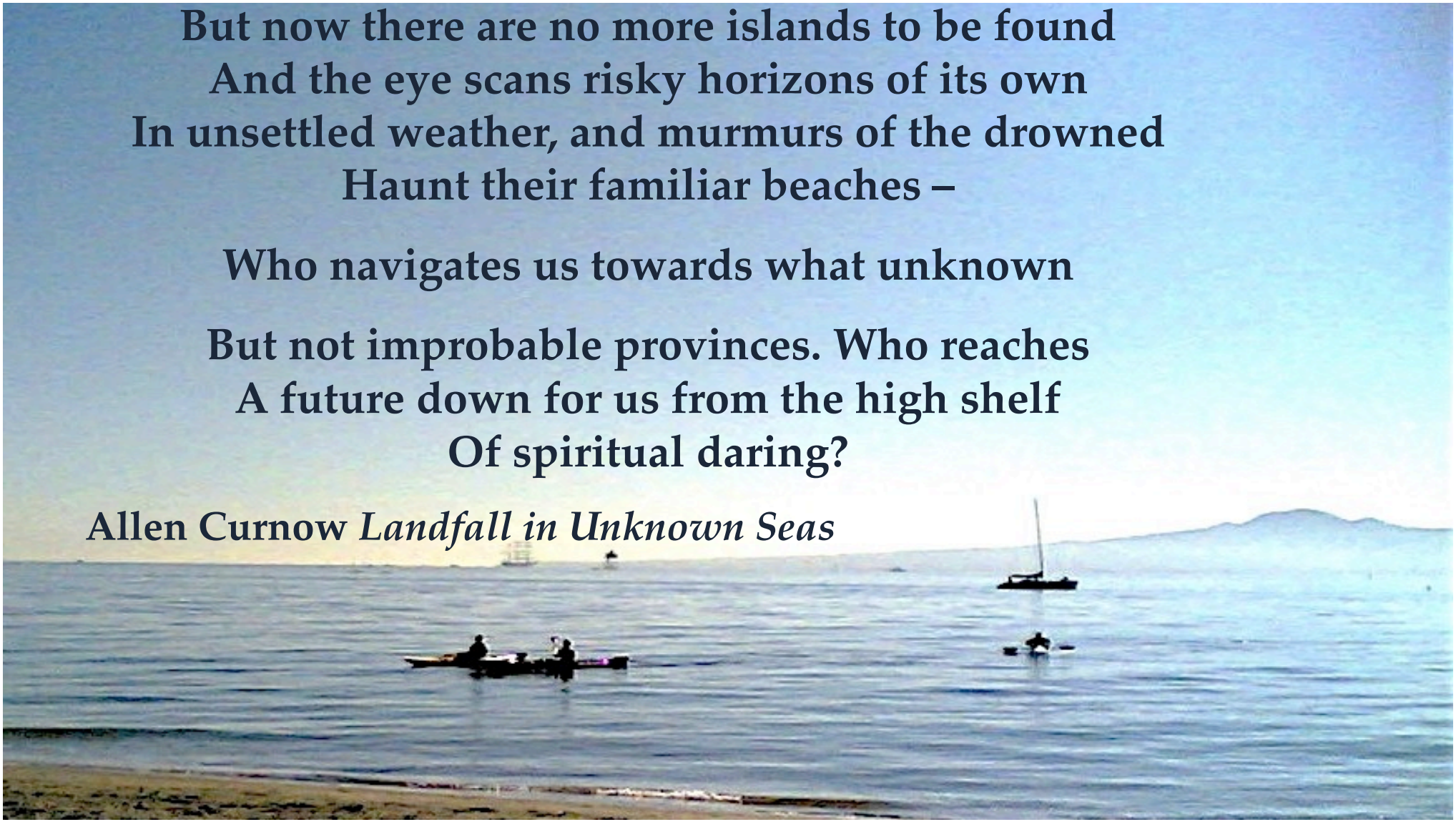
- “The greatest challenge we face is a philosophical one:

  - understanding that this civilisation is already dead.

  The sooner we confront our situation and realize that there is nothing we can do to save ourselves,

  the sooner we can get down to the difficult task of adapting, with mortal humility, to the new reality”





But now there are no more islands to be found
And the eye scans risky horizons of its own
In unsettled weather, and murmurs of the drowned
Haunt their familiar beaches –

Who navigates us towards what unknown

But not improbable provinces. Who reaches
A future down for us from the high shelf
Of spiritual daring?

Allen Curnow *Landfall in Unknown Seas*