

Emeritus Professor Frank Griffin
University of Otago
PO Box 56
Dunedin 9054

E: frank.griffin@otago.ac.nz

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Dr. Rod Carr

Climate Change Commission

Kei te rangitira, tēnā koe

Aotearoa New Zealand needs climate policy that addresses our unique challenges

Our climate change policies are inadequate and will limit our ability to make any meaningful difference for mitigating climate change. The national climate narrative is fixated on primary production and specifically farming. In assessing the climate impact of farming, carbon dioxide, nitrous oxide and methane emissions are the main focus. This sets the scene for targeted levies based on greenhouse gas (GHG) sources. The only on-farm greenhouse gas sinks considered are forests and vegetation that meet certain mitigating criteria; and now the Climate Change Commission is recommending that those sinks are not allowed.¹ Soil and pasture have been dismissed as sinks that sequester² or neutralise different GHGs even though soil contains larger stocks of carbon than the atmosphere and vegetation combined.^{3,4}

Distracted by a simplistic framing of the problem, we are diverted from solutions that would provide much more leverage to mitigate climate change. This position negates our ability to achieve Net Zero Values for carbon or any of the GHGs, if we are unable^{5,6} or unwilling to accurately monitor (or prescribe levies for) existing emission levels.

According to the IPCC, 87% or more of methane is recycled by hydroxyl radicals⁷, induced in abundance in Aotearoa New Zealand by water vapour and volatile organic compounds⁸ (VOCs), released from growing vegetation. Yet this sink is completely ignored.

Aotearoa New Zealand has high levels of photosynthesis year-round because of its soils, temperate climate and lush vegetation. This draws down carbon, generates the water vapour that is the raw material for hydroxyl radical production, and directly cools our environment by the transfer of latent heat higher into the atmosphere. This transfer, back into the atmosphere by transpiration-driven cooling, deflects the sun's radiant energy away from the harder surfaces thus mitigating thermal emissions. This natural bounty we are blessed with provides our main agency, alongside eliminating fossil fuels, to moderate the climate. [This video](#)⁹ provides further explanation of the dynamics of water in climate mitigation.¹⁰

If these sinks – soil carbon and hydroxyl radicals – were included in carbon budgets, many farms in Aotearoa New Zealand would be in carbon credit. Finding mechanisms to include reduced heat emissions through the agency of photosynthesis and transpiration would further improve their position. We would then be evaluating farms on net emissions rather than gross emissions.

Our relatively large population of ruminants positions methane as our major GHG. In particular, our solutions must be tailored to this unique context. This means positioning pastoral/animal derived methane in a separate compartment from industrial methane, which may be impacted minimally by atmospheric cleansing plant-based hydroxyl radicals produced by pastures and forests. Recent attribution of increasing levels of atmospheric methane has been unfairly linked to anthropogenic emissions from agriculture¹¹ when recent molecular typing (¹³CH₄) proves that increases in methane are more likely linked with rogue emissions from unsealed oil or gas wells associated with shale gas extraction and fracking.¹²

In addition, primary production remains the mainstay of our economy, recently crossing, for the first time, the threshold of \$50 billion in export revenue. How perverse that we seek to unfairly hobble the potential of these industries that generate such resources to mitigate and adapt to climate change. Cities are recognised as urban heat islands, often two degrees centigrade warmer than the countryside and sometimes significantly more. Manufacturing and business activity that happens in cities will struggle to achieve sustainability. Yet primary producers can go way beyond sustainability to regenerate ecosystems, while still growing our food. The problem is not farming itself, but the level of intensification. The solution is the rapid and widespread development of practices that accelerate development of greenhouse gas sinks while fostering greater biodiversity and ecosystem regeneration. This remediates the climate and sustainably produces the food people need. It is consistent with the values embodied in kaitiakitanga.

It is bewildering that agricultural industry bodies have so meekly capitulated to a flawed climate narrative. Some gaze at a distant horizon looking for high risk technological silver bullets, while ignoring nature's capability to sustain balance, if only we would work alongside her. Creating policy that recognises both GHG sources and sinks resonates with the more holistic view of biology and earth systems inherent in mātauranga Māori. We need climate policy that is fair to all people in Aotearoa New Zealand, while it continues to focus on climate remediation.

It is time to widen the debate moving away from inorganic chemical-driven industrial farming practices with high external inputs to biologically-based regenerative practices with proven abilities to build greenhouse gas sinks. The climate, ecosystems, biodiversity, human health and our economy will benefit. Now that is a silver bullet!

In climate change we face an unprecedented existential crisis. If we want our children and grandchildren to enjoy a good life on this planet, we need to re-examine the assumptions that guide present action in the light of emerging understandings. We, the undersigned, ask you to foster the public debate on this important issue.

Recommendations

1. Support research into the efficacy of soil carbon and hydroxyl radicals as sinks and transpiration-driven cooling to moderate the climate.

We applaud the Government's recent increases in climate change research. As with the public narrative, research resources are too focused on technological fixes and ignore the biological cycling perfected by nature. Irrespective of the proportional contribution New Zealand can make to climate remediation, because of our small size, we can provide leadership in providing biological solutions that will position us as world-leading producers of quality foods, with net Zero Carbon emissions.

2. Advance the global debate on GHG sinks (including carbon sequestration in soil, and hydroxyl radicals) and transpiration-driven cooling.

Given that current understandings of methane are very significant for Aotearoa, it is vital that we seek out those globally who share the signatories' perspective of the need to advance the narrative. An example is the planned establishment of a multi-million dollar Indo-German Research Centre in Andhra Pradesh, India, to advance agroecology and reverse desertification of wastelands, increase water storage, retain topsoil and prevent soil erosion.

3. Impose graduated levies on artificial fertilisers.

We support the intention recommended by the Climate Change Commission to introduce graduated levies on synthetic fertilisers, especially urea. A Full Life Cycle Analysis must be carried out to quantify the manifest effects of synthetic nitrogen fertiliser on soil health and nitrous oxide emissions.

4. Identify barriers and enablers for more rapid learning to enable us to moderate the climate.

The current nexus between policy development, science, and the profit motive inhibits our learning. The antidote is greater transparency in how research funding is allocated and decisions are made. We encourage the Government to foster a reflexive research culture that takes full advantage of emerging understandings and transcends the limitations of the current siloed approach to research.

Emeritus Professor Frank Griffin (ONZM, FRSNZ)
Director Ag@Otago, University of Otago
frank.griffin@otago.ac.nz

Peter Bruce-Iri
Independent Researcher
peter@northlandclimatechange.org

Alfred Harris
Scientist (structural biology)

Max Purnell
Farmer

Millan Ruka (MNZM)
Kaitiaki and River Assessor

Marcus Williams
Director of Research and Enterprise, Unitec

Sir Alan Francis Mark (KNZM, CBE, FRSNZ)
Botanist & Environmentalist
University of Otago

Graham Shepherd
Soil Scientist, Agricultural Advisor and author of
the FAO *Visual Soil Analysis*

Wendy Bown
Environmental Film Maker

Glenn Edney
Ocean Ecologist

Fiona Douglas
Executive and Organisational Coach

Trish Allen
Retired Organic Farmer

Janette Perrett
Dairy farmer & Chair of Organic Dairy & Pastoral
Group of New Zealand

Richard Bentley,
Freelance Writer specialising in sustainable
agriculture and related science and technology.

Anna Harding
Farmer, Dargaville

Ursula, Erwin, and Shani Eisenmann
Waima Hill Organic Beef

Callum Lane
Lane Family Farm

Sam Hogg
Mingiroa Farm

Steve Erikson
Chaos Springs Farm

Professor Craig Bunt
Inaugural Professor in Agricultural Innovation
Director Agricultural Innovation Programme
University of Otago

Align Farm Group, Ashburton
Dairy Consortium (6 farms)
Impact Investor: John Buchanan
CEO: Rhys Roberts
Environmental Management: Clare Buchanan

Allan Richardson
Avalon Farms, West Otago
Organic and Regenerative Farming
Board member of Organics Aotearoa

Mark and Madeline Anderson,
Westridge Dairy Farm, Clinton
Holistic Annual Grazing

Dylan & Sheree Ditchfield
Ditchfield Group
Dairy Farming and Business Leadership

Phyllis Tichinin
True Health Ltd.

Wayne Douglas
Regenerative farmer and educator

Rhodes Donald
Director, Polson Higgs Wealth Management

International signatories

[Professor John Elkington](#)
Author and Founder & Chief Pollinator, Volans

[Dr Christine Jones](#)
Independent Researcher

[T. Vijay Kumar](#)
Executive Vice Chairman Rythu Sadhikara
Samstha

Professor Peter Byck
[Film maker and academic](#)

[Judith D. Schwartz](#)
Environmental Journalist, USA

John King
Holistic Management Educator

Dr Sebastian Gehricke
Senior Lecturer, Otago Business School
Deputy Director, Climate and Energy Finance
Group, University of Otago

Associate Professor Janice Lord.
Botany Department, University of Otago
Indigenous and Exotic Forestry
Carbon Sequestration

Hamish and Amy Bielski
Rehoboth Farm
Regenerative Farming, Beef & Lamb

Andy Barratt
Organic/Holistic farmer

Siobhan Griffin
Farm Consultant, Next Level Grazing

Jono Frew
Managing Director, Natural Performance Ltd.

Tracy and Fred Ody
Ody Farm

[Professor Peter Head CBE](#)
Founder and Chair, Resilience Brokers

[Walter Jehne](#)
Director, Regenerate Earth

[William Becker](#)
Author and Executive Director, Presidential
Climate Action Project

Jon Schull
[Co-founder of EcoRestoration Alliance](#)

[Gerry Gillespie](#)
Founding member – Zero Waste International
Trust

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