The New Zealand Agricultural Greenhouse Gas Research Centre

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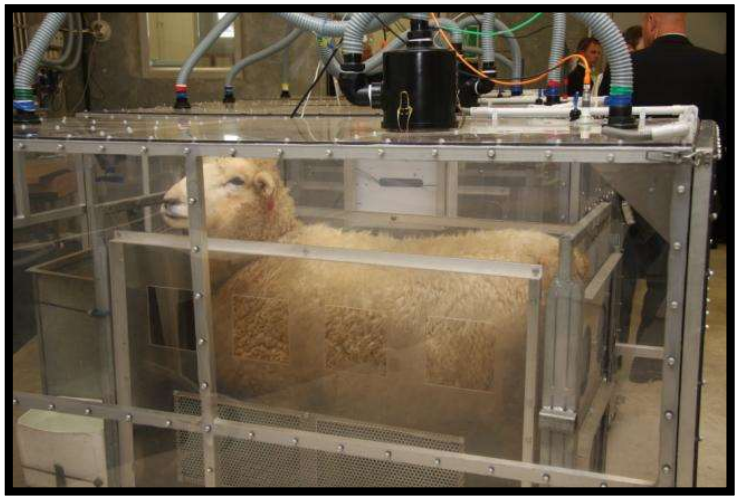
NEW ZEALAND AGRICULTURAL GREENHOUSE GAS Research Centre

Leading Partners in Science

Agriculture drives New Zealand's economy



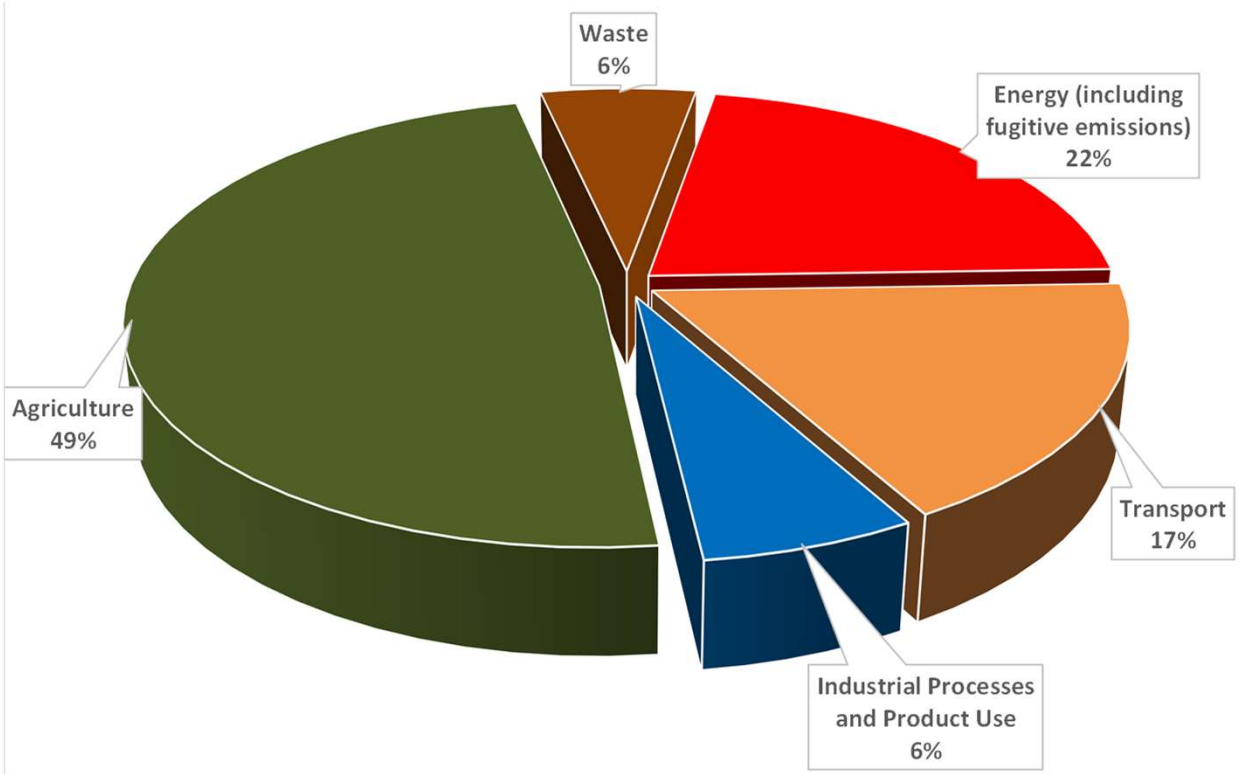
Agriculture 50% of total export value

Pastoral sector $21b, 43% of exports

World's largest dairy exporter,
30% of international dairy trade

49% of national greenhouse gas emissions
(increasing, due to rising dairy production)

Agriculture accounts for half of NZ's emissions



International context

An aspirational goal…

Agriculture is necessary to meet the 2°C climate target.

At the Paris climate conference,

119 countries

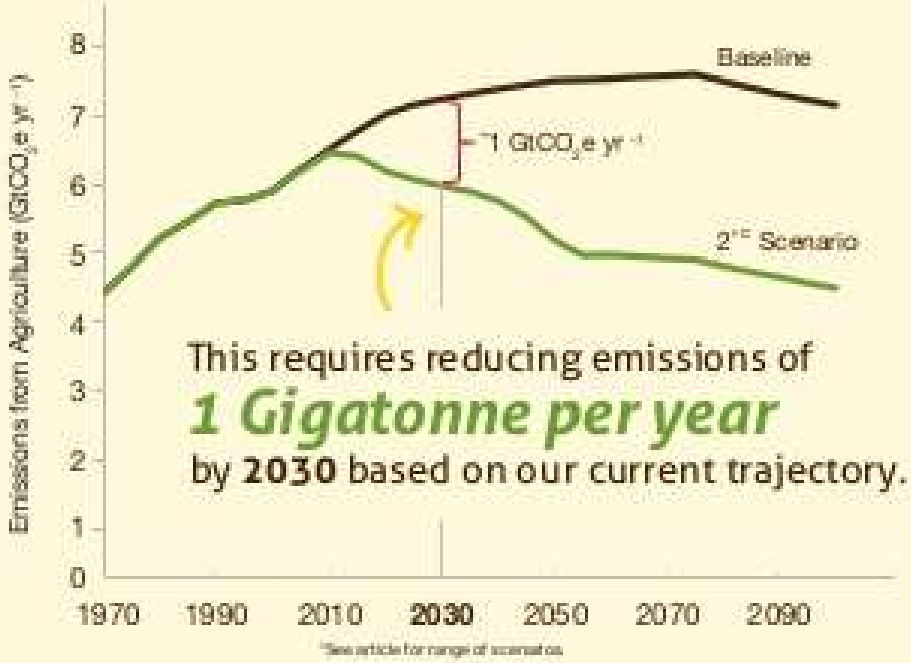
committed to mitigation in agriculture,

(but few set quantitative targets).

Richards et al. 2016. https://ccafs.cgiar.org/agriculture-prominence-indcs-data-and-maps

An aspirational goal…

Agriculture will need to **limit its greenhouse emissions** to only ***6–8 Gigatonnes*** by **2030** while also increasing production.



However, known practices could deliver just **21-40%** of the needed reduction, even if implemented fully at scale.

Top line: Estimated business-as-usual emissions from agriculture
Bottom line: Maximum amount of emissions from agriculture in a 2°C world

Mitigation options for agriculture

1) further increases in animal productivity and farm efficiency & implementation of known technologies

2) additional technologies that directly seek to reduce emissions

3) constraints on the level and types of agricultural activity and movement towards low-emitting land uses

The New Zealand Agricultural Greenhouse Gas Research Centre

Mission: *"To provide knowledge, technologies and practices which enable agricultural activities to continue to create wealth from agriculture for New Zealand in a carbon constrained world."*

Opened 3 March 2010 by Prime Minister John Key

100% Government funded: $50 million over 10 years (2009-2019)

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Leading Partners in Science

agresearch · DairyNZ · Landcare Research Manaaki Whenua · Lincoln University · Massey University · NIWA Taihoro Nukurangi · PGgRc · Plant & Food Research · SCION

Vision

"To be an internationally renowned centre for research and development into agricultural greenhouse gas mitigation solutions"

The Centre will:

Fund research into practical, cost-effective mitigation technologies/practices

Improve coordination of GHG mitigation research

Increase NZ GHG mitigation research capacity/capability

Lead NZ's science input into the Global Research Alliance

Science 2013 - 2018

WORKING TOGETHER

Methane

- **Low Methane Animals:** naturally low methane emitting sheep & cattle
- **Low methane feeds:** feed options that can help reduce GHG emissions
- **Methane Vaccine:** Produce a vaccine to inhibit methane production
- **Methane Inhibitors:** inhibitors against methane generating microbes

Nitrous oxide

- **Reduce nitrous oxide and nitrate leaching**: Develop new and support existing technologies and develop on-farm management options: nitrification inhibitors; low N_2O plants; animal management

Soil carbon

- **Increasing soil carbon:** Identifying ways to increase the carbon content of New Zealand grassland soils: alternative pasture species; irrigation management; deep inversion tillage

Integrated systems

- demonstrate GHG implications of more efficient farm systems

Improved research coordination

- **Complex national funding landscape; multiple funders but no single national strategy**
- **MPI the dominant funder – NZAGRC, SLMACC, Inventory Fund, NZ GRA fund**
- **Funding coordination improved by**

➢ **NZAGRC-PGgRc joint research programme**

➢ **Common key personnel involved in determining funding priorities & funding decisions**

➢ **Main research providers co-invest in NZAGRC programmes**

Capability development

Capability	Number
PhD students	11
Post-doctoral researchers	3
Senior research fellow	1
Scientists working in programme	50+








Capability & capacity development

New Zealand Ruminant Methane Measurement Centre