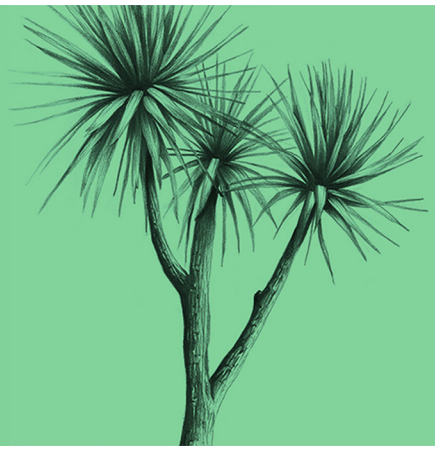
AGRICULTURAL EMISSIONS MITIGATION IN NEW ZEALAND



An Executive Summary

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INTRODUCTION

Farmers change slowly.
Avoid pain with clear signals.
Research; replace cows.

The starting point for this report is the internationally agreed-upon goal of limiting global warming to below two degrees and New Zealand's commitment to contribute its 'fair share'. The report focuses on the role of mitigating agricultural emissions within that, and how New Zealand could most cost-effectively mitigate its own emissions and contribute to the mitigation of agricultural emissions abroad.

KEY ISSUES WHEN SETTING GOALS FOR NEW ZEALAND

In order to limit global warming to two degrees, global net carbon dioxide (CO_2) and nitrous oxide (N_2O) emissions must reach zero before 2100. By that time, food production will need to have low N_20 emissions per unit of nutrition.

Mitigation of N_2O can, from a purely scientific point of view, be valued similarly to CO_2 reductions (measured with standard international metrics).

Reducing methane (CH_4) is valuable at all times, but because it is a short-lived gas, New Zealand could choose to put less value on CH_4 reductions than standard international rules currently imply. This choice depends on

- the weight New Zealand puts on the short-term path of climate change against the longer term goal of limiting peak temperatures;
- whether New Zealand faces strong international pressure to reduce CH_4. Not mitigating could impose high economic and reputational costs; and
- the recognition that giving a lower weight to CH_4 mitigation can only be justified scientifically in the near term. If New Zealand accepts the global goal of limiting warming to below 2°C, and international action is on track to achieve that goal, then the importance of CH_4 mitigation will rise steadily and significantly over the next few decades.

The form of New Zealand's international target can be separated from the level of ambition (and cost) and the form of its domestic policy. While these interact, each could be optimised separately.

In the medium to long term New Zealand may decide to reduce CH_4 significantly while still maintaining food production. It could prepare for this now with research into low-emission food production and continued work on technology to reduce CH_4 from livestock, and by starting a gradual adjustment process for land use and practices. Delaying the adjustment may require it to happen very quickly in the future, if climate damages and greenhouse gas (GHG) prices are even higher than anticipated.

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Agriculture is unique as an emitting sector only because N_2O emissions cannot currently go to zero: we need food, and any food that requires inputs of nitrogen (N) – from fertiliser, biological N fixation or green manure – will result in anthropogenic N_2O emissions.

All other characteristics are shared by at least one other sector, though the combination of characteristics is unusual. Key features are: global concerns about scarcity of consumer products (food security concerns in the case of agriculture); that emissions are often controlled by small agents; complex mitigation and monitoring (driven by biological complexity in the case of agriculture); that agriculture is strongly exposed to international competition (trade exposed) but not strongly subject to leakage of production. Their trade exposure means that farmers are unable to pass on much of the cost of mitigation or emissions liabilities.

A focus on producing low-emission nutrition would help balance emission reduction with global nutrition needs.

OPPORTUNITIES AND CHALLENGES

The emission intensity of existing products can be reduced with technologies and practices already used on many farms. Most options would also raise productivity – but not necessarily profitability. Some barriers to adoption are not financial.

A critical question for policy design is to what extent farmers can continue – and accelerate – their existing decline in emissions intensity beyond business as usual.

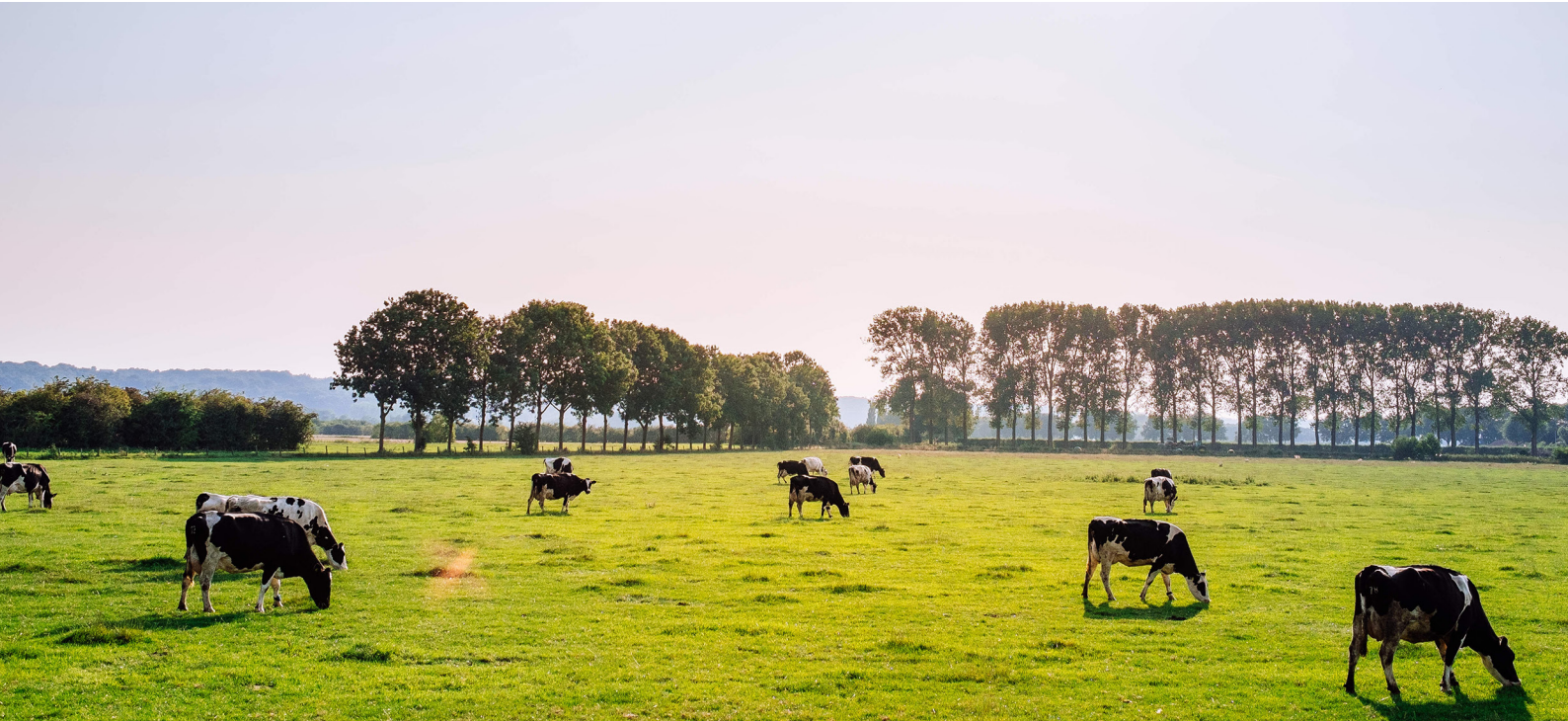
New Zealand could potentially use currently pastoral land to produce alternative low-emission products. This transition will occur most easily if it can happen over decades.

Reducing food waste and gradually changing diets toward lower emissions nutrition sources are important parts of the solution.

New Zealand's past and future experiences with mitigation could help other countries lower the emissions intensity of their agricultural production.

New Zealand may efficiently, from a global point of view, continue to be a major producer of emissions-intensive nutrition. This would imply high costs if New Zealand's emissions targets don't take this into account.

Key challenges of mitigating agricultural emissions are: farmers' trust and capability; limited practical experience with mitigation; uncertainty among scientists and farm system experts about the effectiveness, feasibility and cost of mitigation options; limited current mitigation options within livestock systems; complex monitoring and enforcement issues; protecting rural communities and the New Zealand economy during the transition; and creating a favourable international environment.



POTENTIAL DOMESTIC ACTIONS

Engage the rural sector positively

- Involve the rural community effectively in climate policy governance.
- Potentially negotiate a 'cool climate' accord with the farming sector.
- Use farmers to help other farmers reduce emissions domestically and internationally.
- Continue to support reforestation on farm land.
- Celebrate the low-emissions-intensity of New Zealand livestock products, and promote them through a national brand.
- Re-focus the national conversation on the profitability of the rural sector, not the volume of production.

Research

- Develop alternative low-emission food production for New Zealand's landscape. This is an area that needs more systematic research, field trials and development of supply chains.
- Continue work on low-emission technology for livestock production that is internationally applicable.
- Help determine appropriate absolute agricultural mitigation for New Zealand's international target setting by comparing the nutritional value of different products relative to the emissions associated with them. This may require identifying and testing the implications of different nutrition metrics for global food markets.
- Develop robust, user-friendly, on-farm emissions monitoring and reporting tools that can reflect the mitigation outcomes of individual farmer practice changes.

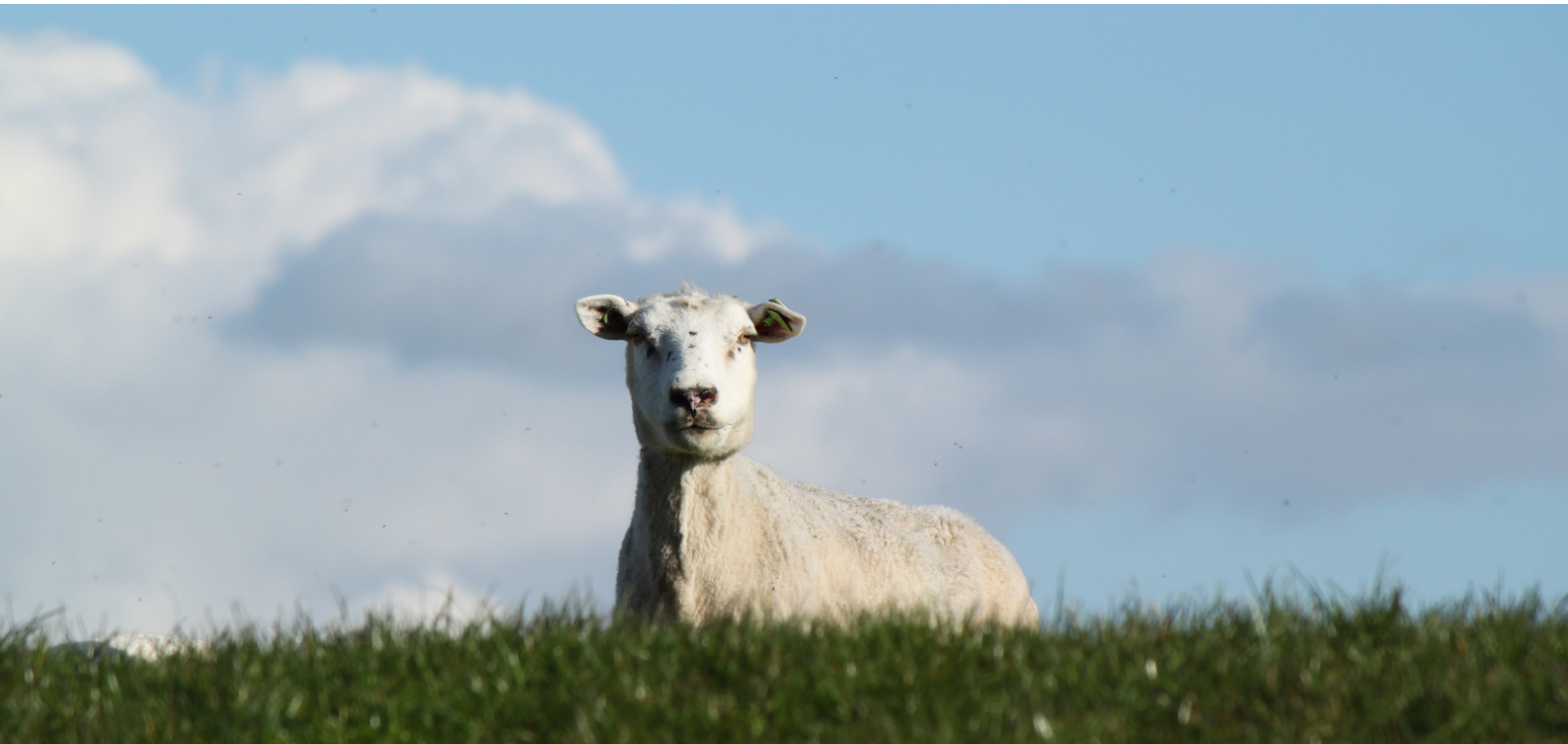
Increase capability to move to low-emission agriculture – on- and off-farm

- Educate future (and current) farmers at all levels about the need for and opportunities associated with low-emission agriculture.
- Engage the business sector and business schools to help build new products, complete supply chains and develop effective marketing.
- Include information about emissions performance of animals in or alongside their Breeding Worth.

Regulate outside the ETS

- Through regulation, help to create an environment conducive to transition that can also act as a backstop to bring up the tail of farmers when the majority have already made a transition.
- Develop a capital gains tax on rural land.
- Continue to promote freshwater reform.

Note that direct regulation of land use or practices is difficult to do well because farm situations are so heterogeneous. No significant GHG mitigation options are obviously appropriate on all farms. Some regionally specific performance benchmarks for emissions intensity and some land-use restrictions may be appropriate.



Consider including agriculture in the Emissions Trading System (ETS), noting that:

- Including agricultural emissions in the ETS at the processor level is possible now and would have some benefits including some incentives to try non-ruminant land uses. Leakage is unlikely to be a large issue unless effective prices are high.
- A farm-scale ETS is a more efficient option. Better measurement tools and greater farmer acceptance are needed before a broad farm-scale ETS can be implemented. Offering farmers a fixed-price option that is periodically marked to market, rather than requiring that they purchase and surrender units, could facilitate compliance.
- The feasibility of a mixed system with larger farms (particularly dairy) regulated at the farm scale and the default at the processor could be explored as a way to transition into a full farm-scale ETS.
- Managing the rural community transition and balancing distributional impacts across diverse farmers are both challenges that might be most easily addressed through early but gradual introduction.
- A tax or levy system would face the same challenges as the ETS.

INTERNATIONAL CONTRIBUTION

New Zealand can continue to lead research both on mitigation technologies and mitigation policies in the agricultural sector and continue to train international students. This could extend beyond livestock agriculture to focus more on alternative low-emission food production on land currently used for livestock. There is also room for more active engagement to help developing countries begin to transform their agricultural sectors to low-emission food production – and more generally, climate-smart agriculture.

It is in New Zealand's interests for agricultural emissions to be included in any international agreement. As with any other sector, recognition of the potential for mitigation over different time frames will affect our targets.

New Zealand could potentially gain credit, and help develop new mechanisms, for transferring resources for mitigation in developing countries. This could be done by working with developing countries to implement large-scale efforts to transform their agricultural sectors, and results-based funding where rewards are determined at a national scale and are proportional to monitored emissions relative to an agreed baseline projection.

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