Chapter 17

Aronga Kaupapa – Ahuwhenua
Policy direction for agriculture

Summary

Aotearoa has been an agricultural world leader over recent decades, putting it in a strong position to continually improve and contribute to meeting the 2050 targets.

Our analysis shows that even without new technologies, Aotearoa can reduce agricultural emissions through efficiencies on farms, and by switching some pastoral land to forestry and horticulture. Investing in research and development now could provide more flexibility, and potentially make it possible to meet the more ambitious end of the 2050 biogenic methane target.

Farmers have already made progress in reducing emissions, but further changes can lower emissions on farm while maintaining, or even improving, productivity. This includes reducing animal numbers and using better animal, pasture and feed management. Policy support is needed to make this happen.

We recommend that the Government:

- **Follow through on its commitment to implement a pricing mechanism to incentivise on-farm emissions reductions.** The Government must make a decision on this by 2022 so farmers can feel confident to start taking action. The mechanism should consider the unique circumstances of Iwi/Māori collectively-owned land, and the rights and interests of Māori-collectives within the agriculture sector.
- **Work with industry to develop advisory services** to support farmers to adopt emissions-efficient practices and make the most of opportunities to diversify land use and income. This must include services tailored for Iwi/Māori.
- **Improve rural digital connectivity** to give farmers access to information and online tools to monitor and improve farm performance and reduce emissions.
- **Remove barriers to the deployment** of emerging technologies that reduce emissions – such as streamlining food safety legislation.
- **Support systems and infrastructure for alternative, lower emissions land uses** so that there is more potential to convert land to low emissions uses in future. This includes, for example, infrastructure and supply chains for horticulture.

- **Invest in research and development** to deliver technology, such as methane vaccines and inhibitors, that would enable bigger emissions reductions in the future. If developed, these technologies could provide more flexibility for farmers in achieving emissions reductions and enable Aotearoa to increase ambition.

Changes in our final advice

During consultation we heard from some that we weren't ambitious enough in agriculture, while others said we were being too optimistic in the assumptions about the potential for emissions reductions. We have adjusted our assumptions about the emissions that can be reduced through on-farm improvements. We also tested paths with more land-use change to horticulture.

We have been clearer on our role over the next year to assess the progress of *He Waka Eka Noa* and to assess the readiness of the sector for pricing emissions.

We reviewed the limited evidence available on the potential emissions reductions impacts of phasing out synthetic nitrogen fertiliser on dairy farms. We will be providing advice related to agricultural emissions pricing in 2022, and will be better able to assess these options, and how they might work alongside a pricing mechanism, at that time.

Introduction

1 Agriculture accounts for 91% of biogenic methane emissions in Aotearoa, and 19% of long-lived gases.

2 Agriculture is a major part of the emissions profile, economy, and landscape of Aotearoa. Reducing emissions from agriculture will be critical to achieving the target to reduce biogenic methane by at least 10% by 2030 and between 24 – 47% by 2050. Reducing nitrous oxide from agriculture can also make an important contribution to achieving the 2050 net zero target for all other gases.

3 An integrated package of policies will be required to drive these reductions while balancing the economic and social impacts of changes to the sector, as well as adaptation needs. While recent policy changes to address water quality concerns will also reduce greenhouse gas emissions, further action is required to reach the 2030 biogenic methane target, and the 2050 target.

4 The recommendation in this chapter draws on the three pillars of our policy approach: actions to address barriers; pricing to influence investment and choices; and enabling innovation and system transformation.

5 Ensuring effective pricing of agricultural emissions must be a priority and is central to our advice. There is also a range of barriers that currently hinder improvements to on-farm efficiency, including access to information about how different management approaches affect emissions.

6 In our policy direction we recommend improving advisory and information services for farmers and land managers to enable immediate actions that reduce emissions in the first three emissions budgets.

7 Action is also needed to help spur innovation and lay the groundwork for more systemic change and deeper emissions reductions. Our policy direction recommends improvements to regulatory regimes, developing a targeted research and development plan, investment in infrastructure to support low-emissions land uses, and demonstrating the environmental credentials of low-emissions products.

8 Policy approaches need to consider the unique characteristics and historical circumstances that constrain management of Māori collectively-owned land, and must give effect to the Treaty

principles of partnership, protection, participation, and equity while also recognising the guarantee of rangatiratanga and kaitiakitanga under Te Tiriti o Waitangi/The Treaty of Waitangi.

17.1 Reduce biogenic agricultural emissions through on-farm efficiency and technologies

9 Emissions from agriculture include biogenic methane from livestock and nitrous oxide from animal excreta and fertiliser use. Changing the way farms are managed can help to reduce these emissions.

10 Our analysis suggests that agricultural emissions can be reduced in line with the 2030 biogenic methane target by making changes to on-farm management practice alongside some land-use change. These actions will also contribute to nitrous oxide emissions reductions, which are largely related to the amount of nitrogen added to the land through urine, dung, and fertiliser – which in turn is correlated to animal numbers and feed.

11 Biogenic methane emissions are largely a function of the amount and type of feed a ruminant animal eats. Reducing methane emissions therefore relies on management practices that reduce the total amount of feed consumed across a farm system.

12 More efficient herds and flocks use less feed for maintenance (keeping animals alive and healthy), with a greater proportion of feed being used for production (milk, meat and wool). This means that reducing the total amount of feed consumed across the farm system does not necessarily reduce overall production. There are opportunities to improve general efficiency and reduce emissions across the system, although this is a challenging task that requires changes across complex farm systems.

13 On-farm changes that can reduce emissions include adjusting stocking rates, managing supplementary feed and nitrogen inputs for emissions efficiency. Breeding low-emissions sheep into the national flock and using low nitrogen feeds can also reduce emissions.

14 These changes will be important for reducing emissions right across the sector. However, the best approach will vary from farm to farm depending on a range of factors – for example, soil type, and farm intensity.

15 To reduce emissions across the sector, farmers need know what their emissions are, and how the changes they make on farm affect emissions. Measuring progress towards emissions budgets and targets will require actions that are implemented on farm to be tracked. Those actions will also need to be incorporated into emissions monitoring in *New Zealand's Greenhouse Gas Inventory*.

16 During consultation, many farmers and industry groups noted how challenging it will be to achieve the scale of change required through changes to management practice alone. Leading farmers will need to share their knowledge to help all farmers implement changes to reduce emissions. Advisory services rely on this type of information to provide evidence-based advice tailored to individual farms.

17 Recent changes to freshwater policy will have an impact on the way many farms are managed. Many actions that farmers take to address freshwater will also reduce emissions. However, more policies are needed to incentivise further adoption of on-farm practices that lower emissions.

18 Climate policy approaches will need to consider other policies that effect on-farm management – such as those aimed at climate, freshwater, soils and biodiversity – to ensure they are mutually supportive and can achieve multiple outcomes (see also Recommendation 9, *in Chapter 12: Policy direction to create an enabling environment for change*). The importance of taking such a holistic approach came through strongly during consultation.

17.1.1 Reducing biogenic emissions requires skilled farm management

19 Farmers are often able to improve animal performance and produce more from fewer animals. Improving herd productivity has been a strong national trend for many years and we heard a desire from many submitters for historic improvements in agricultural emissions efficiency to be better recognised. While there are eventual limits to such improvements, there remains significant scope for them to continue.

20 However, achieving emissions reductions of the scale that is needed will require highly skilled farm management and high-quality data to support decision making.

21 The Biological Emissions Reference Group (BERG) found that a variety of mitigation options already exist across the sector, which can collectively reduce biological emissions by 5–10% without necessarily reducing on-farm profitability.

22 The BERG noted that actual economic outcomes for each farmer will depend on a range of factors, including how mitigation options are implemented, the level of skill required to implement the different options, the nature of different farm systems, as well as commodity and emissions prices.

23 The Government's agritech industry transformation plan seeks to increase use of technologies on farm. Technologies will also help to improve efficiency and reduce environmental impacts. For example, some submitters supported improving rural digital connectivity. This will make it easier for farmers to access the information and data they need to measure and monitor emissions and can support the use of more efficient precision agriculture approaches.

24 Some livestock operations could also reduce emissions by shifting to systems that are less intensive. For example, certified organic dairy farms tend to have lower emissions because they have fewer animals and inputs – including no use of synthetic nitrogen fertiliser. Such farms produce less than conventional farms do, but often remain profitable because of their ability to reduce inputs and attract product premiums.

25 A large number of submitters, particularly NGOs and individuals, were in support of phasing down synthetic nitrogen fertiliser as a way to reduce emissions and improve water quality. It may be economic for some farmers to significantly reduce synthetic nitrogen use, whereas for other farms it may impact their financial viability. Some farmers and industry bodies expressed concern about the impact reduced fertiliser use would have on farm profitability.

26 Regenerative farming systems often have some similar characteristics to organic farms, though with fewer input controls. We heard considerable interest in regenerative agriculture during consultation, but there is not yet a robust evidence base to understand the emissions benefits of regenerative farming in Aotearoa, nor a credible certification market for products.

17.1.2 Agricultural soils are an important source of emissions and removals on farm

27 There are significant soil carbon stocks in pastoral farmland across Aotearoa, which good farming practices can help to maintain. However, farming on drained peatlands is already leading to ongoing loss of carbon from these organic soils. Restoring these peatlands would avoid these emissions – although they are not currently accounted for in our targets.

28 There is significant interest in the potential for certain farming practices to store more carbon in soils. This theme came through strongly during consultation, including in submissions from farmers, NGOs and a range of individuals.

29 Much of this discussion is centred around regenerative agriculture. While there is not yet a robust evidence base for understanding the potential for this in Aotearoa, work is underway to better understand it. This is discussed further in *Chapter 18: Policy direction for forests and other carbon stocks.*

17.1.3 Effective advisory services can support farmers to reduce emissions

30 Effective advisory services support farmers to develop new skills and learn about and adopt practices and technologies that reduce emissions. They help farmers to learn from each other, support good decision making, and can also help improve economic, social and broader environmental outcomes.

31 Reducing emissions across the agricultural sector will require that farmers know what their emissions are. Comparing across farms will improve understanding of what good looks like and accelerate emissions reductions across the sector.

32 For the industry to meaningfully compare across farms, consistency of measurement will be important. A quality evidence base is needed for effective advisory services to draw from when providing tailored advice to individual farms.

33 We heard through submissions that one area where farmer advisory services will be particularly important is to support farmers to develop farm environment plans that have a greenhouse gas management component.

34 Existing education, training, and advisory programmes will need to be scaled up to meet the growing demand for these services, which will be critical for achieving the emissions reductions required from the sector. Further investment will be needed.

35 There is also growing demand for farm advisers who are resourced and trained in measuring and monitoring agricultural emissions. To meet the *He Waka Eke Noa* target of all farmers knowing their emissions by the end of 2022, farm advisors need to be upskilled and new skill bases developed. This will take time. Better data, information, and tools would also help farmers and farm advisors make decisions that support emissions reductions.

36 We also heard during consultation that the current mainstream models of agricultural education, training and advisory services are not fit for purpose for Iwi/Māori needs. Due to the complexities around collective land ownership structures and governance, Māori-collectives working in the agriculture sector need bespoke solutions to support emissions mitigation.

37 There is some support targeted for Māori-collectives, for example Te Ahu Whenua and Te Tumu Paeroa, but this needs to be expanded.

38 There have been recent initiatives to make the sector more sustainable low emissions, such as the Primary Sector Council's *Fit for a Better World*, which has a vision where the health of the climate, land, water, and living systems comes first.

17.1.4 New technologies could support more ambitious emissions reductions in the future

39 The successful development of new technologies and practices would provide greater flexibility for how to meet the 2050 biogenic methane target. It would also allow Aotearoa to meet the more ambitious end of the target range without reducing agricultural production. However, some submitters emphasised that emissions reductions cannot be delayed based on hopes that new technologies will be developed.

40 There are several promising options currently being researched, including a methane inhibitor that would be compatible with pastoral farming, and a methane vaccine. These technologies aim to break the link between livestock feed intake and methane emissions.

41 Research, development, and demonstration (RD&D) focused on farm systems is also important, as it will improve understanding of how different farm practices impact emissions. Some submitters supported continued RD&D focused on agricultural emissions reduction, paired with effective communication with farmers about how to implement practices and technologies that reduce emissions.

42 Some mechanisms supporting RD&D in the agricultural sector will end in the coming years. For example, the Pastoral Greenhouse Gas Research Consortium's contract with Government ends in August 2021.

43 Government investment into RD&D focused on agricultural biogenic methane emissions is currently secured out to 2025, but there is no long-term plan beyond then. A clear long-term plan that lays out where investment should be targeted is needed, including mechanisms to implement that plan.

44 Several submissions proposed genetic engineering (GE) as an approach to reducing emissions, while others were very wary about the market and environmental consequences of using GE in Aotearoa. Some submissions discussed the need for more evidence of effectiveness in farming systems in Aotearoa.

45 The regulatory environment must not hinder the roll-out of effective new emissions-reducing technologies and practices.

46 The country's food safety system serves an important role ensuring products are safe and trusted internationally. However, recent experiences have shown it can take some time to get new mitigation technologies through the system. Streamlining the system would ensure effective new technologies and practices to reduce agricultural emissions can be implemented in a timely manner.

17.1.5 Pricing emissions from agriculture will be critical

47 The Interim Climate Change Committee (ICCC) found that emissions pricing should be a key part of the policy package to reduce agricultural emissions. We support this finding.

48 In contrast to direct regulatory approaches, pricing emissions allows farmers to choose how best to reduce emissions, based on the characteristics of their farm business. Farmers who can reduce emissions at a cost lower than the emissions price will generally do so, while others may choose to pay for their emissions. Pricing can reward farmers who do more, as every tonne of emissions reduced is a tonne that they do not have to pay for.

49 In 2020, a process and timetable was established to prepare the agricultural sector for emissions pricing at a farm level. This included setting milestones in the Climate Change Response Act (the Act) for *He Waka Eke Noa*. These milestones are aimed at fully implementing a system for farm-level accounting and reporting of greenhouse gas emissions, and farm-level plans to measure and manage greenhouse gas emissions, by 1 January 2025 (see Box 17.1).

50 Alongside this, *He Waka Eke Noa* is aiming to provide recommendations on core design features of a farm-level emissions pricing mechanism to Ministers by early 2022.

51 Agricultural activities could still be brought into the New Zealand Emissions Trading Scheme (NZ ETS) at processor level, if insufficient progress is made on primary sector climate change commitments. The Commission is required to report to Ministers by June 2022 on *He Waka Eke Noa's* progress towards its milestones, and the readiness of the sector for pricing.

52 The Act sets out that by the end of December 2022, the Ministers of Climate Change and Agriculture must release a report outlining a system for pricing agricultural emissions at farm level.

53 During consultation many submitters expressed concern about the continued exclusion of agricultural emissions from the NZ ETS, and the time it would take to create an alternative farm-level pricing system. There was also concern from submitters that the farm-level emissions pricing scheme would have such high levels of free allocation that the incentive to reduce emissions would be severely weakened, limiting the scheme's effectiveness.

54 The Commission will assess these issues in its review of *He Waka Eke Noa's* progress and sector readiness in 2022. We expect that further policies will be needed alongside emissions pricing to reduce agricultural emissions. However, what is needed will depend in part on the proposed farm-level tools and pricing mechanism and should be considered alongside them.

55 Successfully implementing farm-level emissions pricing for emissions from livestock will take time, due to the challenges of accurately calculating emissions and building systems for farmers to report and comply.

56 In contrast, there do not appear to be any technical or feasibility barriers to pricing synthetic nitrogen fertiliser emissions at the manufacturer and importer level in the NZ ETS as soon as practicable, as recommended by the ICCC.

57 Some submitters suggested other policies, such as regulating agricultural inputs and limiting the area of land used for dairy farming. There is limited analysis available on the impacts these approaches would have. More work would be needed to understand whether these are a suitable way to address agricultural emissions, taking into account distributional impacts in particular.

58 The sector needs to start acting now to reduce emissions. However, we heard through consultation that some farmers are delaying action because they think they could be 'benchmarked' against their emissions in 2025.

59 Ministers should therefore follow through on their commitment to decide on the design of the pricing mechanism by the end of 2022, as outlined in legislation – including decisions about how assistance will be provided to participants. This would give farmers confidence that they will not be penalised for taking action now to reduce emissions.

Box 17.1: *He Waka Eke Noa* – the primary sector partnership

In 2019, *He Waka Eke Noa* was formed as group of 13 partners from Government, industry, and Iwi/Māori to advance work on climate change action in the primary sector.

Role of *He Waka Eke Noa*

The primary sector, Iwi/Māori and government are working in partnership to:

- Implement a framework by 2025 to reduce agricultural greenhouse gas emissions and build the agriculture sector's resilience to climate change.
- Empower farmers and growers to measure, manage, and reduce on-farm emissions; recognise, maintain or increase integrated sequestration on farms; and adapt to a changing climate.

He Waka Eke Noa is early in a five-year programme aiming to equip farmers with the information, tools and support they need to reduce emissions and build resilience to climate change.

He Waka Eke Noa has milestones set in legislation, including working towards farmers and growers:

- Including the mitigation of greenhouse gas emissions and adaptation to climate change in their farm business and environment plans by 2025
- Having farm-level accounting and reporting systems in place by 1 January 2025

Its Terms of Reference also require *He Waka Eke Noa* to provide recommendations on the core design features of a farm-level pricing mechanism by early 2022.

Te Aukaha

Te Aukaha/the Māori Agribusiness workstream of *He Waka Eke Noa i*s in the process of being established to ensure that Iwi, hapū and whānau perspectives are incorporated throughout the development and delivery of the work programme. Te Aukaha is being led by the Federation of Māori Authorities (FOMA).

***He Waka Eke Noa* and the Climate Change Commission**

Under the Climate Change Response Act 2002, by the end of June 2022 the Commission is required to report to the Government on progress towards farm-level emissions pricing obligations. This must include advice on the progress made towards the milestones of *He Waka Eke Noa* and the readiness of farmers to comply with a farm-level emissions pricing mechanism.

If progress has been insufficient, the Government can bring the agriculture sector (livestock and fertiliser) into the NZ ETS at processor level prior to 2025.

17.2 Create options for alternative farming systems and practices

60 Different land uses have opportunities, risks and implications that have not yet been fully explored and understood in the context of the low-emissions transition. Land is an important resource with the potential to support many important outcomes across environmental, social, cultural, and economic domains.

61 Better data, information, and tools at the national and regional scale would help landowners, Iwi/Māori, local, and central government make decisions across a range of outcomes.

17.2.1 Diversifying land use could reduce emissions

62 Diversifying land uses and switching some land that is currently in livestock agriculture to horticulture or arable cropping could reduce emissions.

63 However, there are significant barriers to changing land use – such as a lack of existing markets, supply chains, access to resources such as water, and a lack of experience, skills, labour, support, and infrastructure. This was reiterated in submissions from the horticulture sector. Investment in new farming systems is higher risk if infrastructure like packhouses, transport and water storage do not already exist.

64 These barriers mean conversions to horticulture and cropping are unlikely to play a large role in the first few emissions budgets, as the land area converted is likely to be a small percentage of that currently in pastoral farming. However, work done in the next few years to address these barriers can unlock options for shifts towards these farming systems to play a bigger role in future emissions budgets.

65 Measurement and verification of the emissions footprint and broader sustainability of products can help show which products meet customers' environmental requirements and could provide a market driver for lower emissions practices.

66 Some submitters, including many individuals, emphasised the importance of giving consumers low-emissions choices, supported by trustworthy information. Providing verifiable, sustainable, low-emissions food and fibre products could help secure and maintain customer relationships and encourage landowners to move to lower emissions land uses.

67 Moving to more horticulture and arable systems will have broader implications for climate adaptation, the need for water availability, along with potential impacts on water quality. Reform of resource management legislation, for example via a Strategic Planning Act, provides an opportunity to take a more holistic, landscape approach.

68 During consultation we heard a lot about the opportunity and importance of integrating trees into farms. Afforestation will be required to meet and maintain our net zero emissions target, and some of this could be integrated onto farms through 'mosaic' land-use systems.

69 Some steep and erosion-prone land can revert to native forest if it is near a seed source – fencing and pest control will be important to support this. Farmers can also plant small blocks of production forest on accessible parts of their land. This will be a particular opportunity for farms that can reduce stock numbers by improving animal productivity.

70 Agroforestry systems are another option. These systems integrate trees into cropping or pasture systems. Approaches will vary by farm, but in many cases agroforestry can enhance on-farm sequestration while also diversifying income. It can also generate significant co-benefits for biodiversity and climate resilience, by providing shade and shelter. *Chapter 18: Policy direction for forests and other carbon stocks* provides more detail on forestry.

Recommendation 24

Reduce emissions from agriculture

We recommend that, in the first emissions reduction plan, the Government commit to:

Accelerating reductions in agricultural emissions by rolling out policies, incentives and tools, and investing to create future emissions reduction options.

This should include the Government:

1. Following through on its legislated commitment to decide in 2022 on a pricing mechanism for agricultural emissions, to avoid ongoing uncertainty which will deter farmers and growers from reducing emissions in the short term. The design of this pricing mechanism:
    a. Must be both suited to the characteristics of the sector and capable of driving emissions reductions in line with emissions budgets and targets.
    b. Must not disproportionately disadvantage or compound historical grievances for Iwi/Māori and must factor in the unique characteristics of Māori collectively-owned land and Māori-collectives. This is particularly important in the design of any methods for providing assistance to participants in the pricing mechanism.
2. Supporting farmers and growers to identify and implement changes on farm to reduce emissions by:
    a. Collaborating with industry to further develop and fund effective advisory services.
    b. Partnering with Iwi/Māori and Māori-collectives to further develop and fund Māori-focused advisory services targeting the specific needs of Māori-collective landowners.
    c. Resourcing and prioritising rural digital connectivity.
3. Removing barriers to the deployment of new technologies to reduce emissions on farm by ensuring relevant regulatory regimes, such as the Agricultural Compounds and Veterinary Medicines Act, do not unnecessarily hinder their adoption.
4. Facilitating domestic and international market acceptability of proven low emissions food and fibre products, by working with the sector, including Māori agribusinesses, to demonstrate their environmental credentials to international customers.
5. Investing to create options for deeper emissions reductions in future by:
    a. Developing a long-term plan for targeted research and development (and uptake/deployment) of technologies and practices to reduce biogenic emissions from agriculture.
    b. Supporting farmers, growers and local government to make well-informed land-use decisions by investing in nationwide land and climate information and decision-making tools, including information and tools relevant for Māori collectively-owned land.
    c. Supporting deployment of the systems and infrastructure needed for alternative lower emissions farming systems and products, including enabling Māori-collectives to participate in these new opportunities.

Recommendation 24

Provisional progress indicators

1. Government to have, by 31 December 2022, developed and published a long-term plan for funding research and development to support reductions in agricultural emissions. Note: The Commission will also be assessing the progress made towards the milestones of *He Waka Eke Noa.*
2. Government to annually, from 31 December 2022, report information on the total investment into research and development into reducing agricultural emissions.

Assessment of our recommendations against our policy approach

Recommendation 24	Action to address barriers	Pricing to influence investment & choices	Enable innovation & system transformation
Reduce emissions from agriculture			
Follow through on legislated commitment to decide on a pricing mechanism for agricultural emissions		✓	
Support farmers and growers to identify and implement changes on farm	✓		✓
Remove barriers to the deployment of new technologies to reduce emissions	✓		
Facilitate market acceptability of proven low emissions food and fibre products	✓		✓
Invest to create options for deeper emissions reductions			✓