

He Waka Eke Noa Discussion Document

Steering Group Discussion Document to support Partnership Targeted Engagement Nov/Dec 2021

This document is a draft discussion document for He Waka Eke Noa Partners to inform targeted engagement with selected groups in November and December 2021. The purpose of the targeted engagement is to hear initial thoughts, and to identify any aspects of the pricing options that will be relevant to farmers' consideration and which the Partnership has not yet addressed.

Along with further modelling and analysis, which is currently ongoing, this will help to inform a much broader engagement in February 2022, where farmers and growers will be able to review the current progress on developing a system to price agricultural greenhouse gases and give their feedback on the options.

In the interests of transparency this document will be publicly available, but feedback is not publicly sought at this time. An updated version will be made available to support broader engagement and provide opportunity for feedback in February 2022.



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Executive Summary

New Zealand's agricultural sector has a role to play in reducing greenhouse gas emissions while remaining profitable and internationally competitive.

Consumers are increasingly demanding products with a low environmental impact. While New Zealand is in the unique position of being home to the most carbon-efficient farmers in the world, New Zealand farmers are determined to be even better.

Pricing agricultural emissions is a priority for the Government and agriculture is the only sector that is not currently in the New Zealand Emissions Trading Scheme (NZ ETS). In 2019, the Government decided to price agricultural emissions and asked the Interim Climate Change Committee (ICCC) to advise on how this could be done through the NZ ETS.

Agricultural sector leaders didn't want Government to determine this on their own. Sector leaders proposed that the Government work in partnership with industry and Māori to achieve the best outcomes for New Zealand and the agricultural sector. This proposal was called He Waka Eke Noa – Primary Sector Climate Action Partnership (the Partnership). This was formally agreed in late 2019 by Government, Industry, and Māori.

New Zealand will be world leading as the first country to price agricultural emissions. The Partnership is committed to designing a pricing system that ensures New Zealand's agricultural products remain internationally competitive while reducing national and global emissions.

What is He Waka Eke Noa – Primary Sector Climate Action Partnership?

He Waka Eke Noa is developing a practical framework to support farmers to measure, manage and reduce agricultural emissions: biogenic methane (CH₄), nitrous oxide (N₂O), and carbon dioxide (CO₂). This includes an approach to recognising on-farm sequestration and other potential mitigations, and an effective system for pricing agricultural emissions from 2025.

The Partnership recognises that creating incentives and opportunities to reduce on-farm emissions requires a broader approach and framework than just focussing on the system for pricing emissions.

Te Aukaha, led by the Federation of Māori Authorities, provides input from a Māori farmer and grower perspective into the Partnership to ensure the support of the land management aspirations of Māori farmers.

As part of He Waka Eke Noa, the Partnership will produce a report to Government on a framework for an appropriate pricing system for agricultural emissions in April 2022. This will be an alternative to the default 'backstop' that agricultural emissions are priced through the NZ ETS. The backstop option is not supported by many industry partners in He Waka Eke Noa.

What's important in a pricing system option?

He Waka Eke Noa is a genuine partnership that builds on the experience and expertise of Māori, Government, and primary sector. Our goal is to design a system that is:

- Effective – reduces agricultural emissions in total and per unit of product
- Practical – clear and simple system that minimises administration costs
- Credible – scientifically robust (includes Mātauranga Māori) and transparent
- Integrated – aligns with wider sector and government objectives and activities
- Equitable – recognises early adopters and has 'equitable' impacts across the agricultural sector.

In addition to these criteria, all Government actions taken to address climate change must uphold the principles of Te Tiriti o Waitangi, to avoid further inequity resulting from addressing climate change.

Partnership Options

He Waka Eke Noa partners will ask farmers and growers about policy options before giving advice to the Government. A range of options were considered by the partners, and the options that the partners will seek feedback on are:

1. Farm-level levy
2. Processor-level hybrid levy.

This document also covers the 'Backstop' – Agriculture in the NZ ETS – to support understanding on how the Partnership options differ from the current legislated alternative.

These options perform differently against the criteria, and the Partnership has to consider the trade-offs between the options.

The 'Backstop' – Agriculture in the NZ ETS

The Government has legislated that agricultural emissions will enter the NZ ETS if an effective and workable alternative is not put forward by the Partnership.

The key features of the 'backstop' are:

- Emissions are calculated at the meat, milk, and fertiliser processor level, based on the quantity of product received from farms, or in the case of fertiliser, sold to farms.
- Processors would likely pass on the cost to farms based on the quantity of product processed, or fertiliser bought.
- Initially 5% of emissions from agriculture would be priced (95% of emissions would be freely allocated to processors). Free allocation is expected to reduce by one percentage point a year.
- All gases would be treated the same, i.e., N₂O and CH₄ would be priced at the same rate per tonne of carbon dioxide equivalent (CO₂e).
- Currently only sequestration (carbon removals from vegetation) eligible for the NZ ETS is recognised.
- Government intends that any revenue raised through the backstop would be invested back into the agricultural sector to support further emissions reductions. This could include paying for sequestration not eligible for the NZ ETS (e.g., riparian plantings).

Advantages and disadvantages:

- Low administration costs, estimated at \$10 million per annum (\$8 million cost to agricultural processors, which includes time spent reporting and auditing, transaction costs of passing the cost on to farms, and any fees for purchasing the required New Zealand Units (NZU), and \$2 million for operational costs).
- A processor-level price signal is blunt, only applies to farms that sell directly to processors and does not recognise individual farms for the actions they take to reduce emissions.
- Does not treat N₂O and CH₄ differently.

Farm-Level Levy

The key features of farm-level levy are:

- Emissions are calculated at farm level using farm-specific data. The farm then pays a price for its net emissions.
- A split-gas approach to pricing would be applied, which means that different levy rates would apply to short-lived (CH₄) and long-lived (N₂O and CO₂) gases. This approach reflects that CH₄ is not required to reduce to net zero.
- Rewards eligible on-farm sequestration and can offset some of the cost of the emissions levy.

- Any revenue raised through the levy would be invested back into the agricultural sector to generate further emissions reductions through research and development, incentives to uptake technology, or actions on-farm that help reduce emissions.

Advantages and disadvantages:

- Enables a split-gas approach (treats N₂O and CH₄ differently).
- Calculates emissions at farm level which recognises a greater number of efficiencies and mitigations that could be taken up by farms.
- Farms who have taken early action to reduce emissions will face a lower emissions cost because emission reductions from on-farm efficiencies and mitigations are recognised in the tool to calculate on farm emissions.
- Farms who have taken early action to maintain and increase sequestration will be rewarded because future sequestration from existing vegetation will be recognised (if it meets He Waka Eke Noa requirements).
- Setting an affordable price for all farms is unlikely to be effective at reducing emissions.
- Significant administration costs, estimated at \$113 million per annum (\$63 million cost to farms in time spent reporting, and \$50 million for operational costs).

Processor-Level Hybrid Levy

The key features of the processor-level hybrid levy are:

- Emissions are calculated at the meat, milk, and fertiliser processor level, based on the quantity of product received from farms, or in the case of fertiliser, sold to farms.
- Processors would likely pass on the cost to farms based on the quantity of product processed, or fertiliser bought.
- A split-gas approach to pricing would be applied, which means that different levy rates would apply to short- and long-lived gases. This approach reflects that CH₄ is not required to reduce to net zero.
- Any revenue raised through the levy would be invested back into the agricultural sector to generate further emissions reductions through research and development, incentives to uptake technology, or to reward actions on-farm that help reduce emissions. One option considered for revenue recycling is an Emissions Management Contract (EMC).
- Farms (individually or in collectives) could choose to enter into an EMC to get a payment for reducing emissions and/or for recognising sequestration on-farm.

Advantages and disadvantages:

- Enables a split-gas approach (treats N₂O and CH₄ differently).
- Administration costs for processor-level hybrid levy are likely to be less than farm-level levy.
- Could provide a transitional step towards a farm-level pricing system.
- A processor-level price signal is blunt, only applies to farms that sell directly to processors, and does not recognise individual farms for the actions they take to reduce emissions. EMCs would reward individual farm action and make a processor-level price more effective at reducing emissions.
- Farms who have taken early action to maintain and increase sequestration can be rewarded via an EMC because this includes recognising future sequestration associated with existing vegetation (if it meets He Waka Eke Noa requirements).
- There is potential for EMCs to recognise farms who have taken early action to reduce emissions, however, to be effective at incentivising emission reductions EMCs may require the use of a benchmark, which could disadvantage those who have taken early action to reduce. The detail of how this could work is still being worked through.

On-Farm Sequestration

Both the farm-level levy and processor-level hybrid levy would recognise on-farm sequestration. These would:

- Recognise some vegetation types not currently eligible for the NZ ETS. It would not recognise NZ ETS eligible exotic forestry.
- Recognise vegetation categories that are either permanent (indigenous/native vegetation that will not be harvested) or cyclical (vegetation that is felled and re-established, generally exotic species).
- Recognise indigenous regenerating/planted forests, riparian planting, shelter belts, perennial cropland, non-NZ ETS eligible woodlots/tree lots, and scattered exotics.
- Use different methods to calculate sequestration depending on the vegetation type.
- Place liabilities on vegetation if it is cleared (permanent categories) or cleared and not replanted (cyclical categories). This only relates to vegetation that is entered into the He Waka Eke Noa system. There are also provisions for when vegetation is removed as a result of adverse events and customary harvest.
- Provide a pathway for other forms of sequestration (e.g., soil carbon, tussock grasslands) to be on-boarded when there is sufficient evidence or measurement techniques.

What's next?

The He Waka Eke Noa partners are planning broad nationwide engagement with their farmers and growers in February 2022. Feedback from engagement will form part of the final policy recommendations to the Minister of Climate Change and the Minister of Agriculture in April 2022.

Introduction

He Waka Eke Noa – the Primary Sector Climate Action Partnership is a collective commitment between Government, Industry, and Māori. It was formed in response to proposed Government policy to bring agriculture into the NZ ETS and to the challenges posed by climate change. The partnership aims to contribute to the global efforts under the Paris Agreement, to limit the global average temperature increase to 1.5 Celsius above pre-industrial levels while maintaining food production.

He Waka Eke Noa covers all agricultural greenhouse gas emissions including:

- Biogenic methane (CH₄) – generated by ruminants as a by-product of digestion (less than 5% comes from dung and effluent systems).
- Nitrous oxide (N₂O) – released into the atmosphere from dung and urine patches, and nitrogen (N) fertilisers.
- Carbon dioxide (CO₂) – urea N-fertilisers contribute to farm CO₂ emissions.

Why are we doing this?

He Waka Eke Noa partners are working to enable sustainable food and fibre production for future generations while remaining profitable and competitive in international markets. The aim of He Waka Eke Noa is to build a system for farms to report their greenhouse gas emissions by 2024, have a plan to manage greenhouse gas emissions and adapt to a changing climate by 2025, and be incentivised to act on emissions through an appropriate pricing system in 2025.

He Waka Eke Noa is designing an alternative pricing system to the NZ ETS for agricultural emissions so that the system can:

- Recognise and reward on-farm changes that reduce emissions
- Apply a split-gas approach to recognise the difference in climate impact between different gases
- Recognise on-farm sequestration that the NZ ETS does not
- Ensure that revenue generated helps reduce emissions in the agricultural sector.

The Government has regulated a biogenic methane target for 2030. Other policies and land use change will go some way towards helping achieve the Government's target.

Effect of other Environmental Policies on Emissions Reductions: initial modelling shows that by 2030 under other current environmental policies (National Policy Statement for Freshwater, and Forestry in the NZ ETS), there would be a reduction below 2017 levels of 3-4% in agricultural sector CH₄ emissions, and 2% in the sector's N₂O emissions.

An appropriate pricing system is part of a broader framework that can recognise or reward decisions that are made on-farm and encourage emissions reductions. Farms may also receive signals and support to reduce emissions from other sources such as consumers, banks, processors, and other policy. It is important we continue to support the hard work our farmers and growers have been doing to reduce the environmental impact of their business.

What is the purpose of this document?

As part of the He Waka Eke Noa process, the Partnership needs to provide advice to the Government by April 2022 on an alternative to the NZ ETS, for the pricing of agricultural emissions and recognition of sequestration. The Government will consider this advice, along with separate advice from the Climate Change Commission on the Partnership's progress.

He Waka Eke Noa partners are seeking feedback from farmers and growers on potential options before giving advice to the Government. To help farmers make comparisons, this document outlines the 'backstop' of agriculture in the NZ ETS at the processor level, as well as two options developed by He Waka Eke Noa: **Farm-Level Levy** and **Processor-Level Hybrid Levy**.

The He Waka Eke Noa partners are undertaking targeted engagement on the options in November and December 2021, ahead of broad engagement with their farmers and growers in February 2022.

Achieving an equitable outcome for Māori

Giving effect to Te Tiriti o Waitangi, which includes the Tiriti principles of partnership and active protection, will need to be considered in the system design and pricing system, and include such matters as:

- Providing opportunities for Māori to partner in governance arrangements, and have oversight of the implementation programme, including decisions on revenue distribution and monitoring
- Ensuring that resourcing provides for equity in outcomes, and the overall design and pricing system does not disproportionately disadvantage Māori farmers, growers, and landowners
- Initiatives to assist and support farmers and growers to implement He Waka Eke Noa, provided by Māori for Māori solutions
- Targeted information and support to better enable Māori to avoid any adverse impacts, and
- Support for roles for Māori as advisors and auditors in the implementation programme.

In *Inaia tonu nei: a low emissions future for Aotearoa*, the Climate Change Commission places emphasis on ensuring that the transition to a low-emissions economy does not compound historic grievances and further disadvantage Māori. He Waka Eke Noa design elements will consider the impact on Māori landowners and the adjustments required to address any equity issues and give effect to Te Tiriti o Waitangi.

Through the bicultural relationship established by the Te Tiriti o Waitangi, we have an opportunity to develop a shared set of values and responses to reducing greenhouse gas emissions and to ensure that the impact of the transition to a low-emissions society in Aotearoa does not compound the historical injustices that Māori in the food and fibre sector continue to experience.

The options presented in this document must consider the unique circumstances of Māori landowners and the rights and interests of Māori collectives within the sector. The Partnership must recognise the unique land tenure and ownership structures that Māori land authorities operate within, and the historical impediments and legislation that constrain the development and use of Māori land.

The system must also embrace the Māori world view of Te Taiao (the entire interdependent system of the environment that sustains life), and the responsibilities of those that are kaitiaki of their whenua (the appointed guardians of their lands). In line with Te Ao Māori, the He Waka Eke Noa system aims to recognise the interlinkages between multiple environmental policy frameworks (water, land, and biodiversity).

Māori land

The modelling done by He Waka Eke Noa to date has not specifically addressed these structural differences. The case studies factor this in, to a certain extent, but the output presented is financial only. Further analysis on the impacts of emissions pricing on Māori land is underway.

The framework must consider the implications for Māori Agribusiness. While many of the impacts faced by the primary sector will be similar across different sectors (i.e., impacts per kg of product will be the same), the land tenure structures faced by Māori landowners are different, meaning Māori landowners may be impacted differently. Under Te Ture Whenua Māori Act 1993, owners of Māori freehold land are significantly restricted; (1) to using the land administration structures contained within the Act, and (2) in transferring ownership of the land.

Many Māori farming entities are intergenerational, made up of multiple blocks of land ranging in size, and often with multiple land uses within one entity (e.g., sheep and beef, dairy, and horticulture). A significant proportion of Māori-owned land is leased out with a multitude of leasing arrangements, some of which are mandated, and most of which are very long-term.

Māori farming entities are diverse in structure ranging from small-scale blocks, through to multi-farm entities with vertical integration in the supply chain. Many of these entities have multiple landowners with a varying degree of input into how the businesses are run. Outcomes from the land are broad and a financial return is generally a secondary consideration to wider outcomes for whānau, hapū and iwi such as the health and wellbeing of the land and water.

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Backstop: Agriculture in the NZ ETS

New Zealand has a legal and policy framework in place to address climate change, including the Climate Change Response Act 2002, and the New Zealand Emissions Trading Scheme (NZ ETS).

Currently greenhouse gas emissions from all other sectors (electricity and gas, transport, industry, waste, and forestry) are priced via the NZ ETS.

The NZ ETS is the legislated 'backstop' for pricing agricultural emissions if an effective and workable alternative is not delivered through He Waka Eke Noa.

Who is responsible for reporting and paying for emissions?

Processors (dairy and meat) and synthetic fertiliser manufacturers and importers would be responsible for reporting and paying for short-lived (CH₄) and long-lived (N₂O and CO₂) emissions. It is expected that this would be passed on to farms through reduced pay-outs and increased fertiliser costs.

How are emissions calculated?

Emissions would be calculated using national average emissions factors for relevant products, e.g., milk, meat, and synthetic fertiliser. These use emissions per kg of agricultural product produced, or per tonne of synthetic fertiliser sold.

The way emissions are calculated for a processor-level price does not reflect any differences in on-farm practices that change an individual farm's emissions. The only way individual farms can reduce the passed-on cost they pay for emissions is by producing fewer meat or milk products or using less synthetic fertiliser.

How are emissions priced?

Initially 5% of emissions from agriculture would be priced (95% of emissions would be freely allocated to processors). Short- and long-lived gases are treated the same with a carbon equivalence metric (GWP₁₀₀). Processors would be required to purchase New Zealand Units (NZUs) from the NZ ETS market or government auctions, and then surrender (give to the administering entity) NZUs to cover their total emissions. Therefore, the cost they face would be the carbon price at the time. See below for how rebates would affect this cost.

How can emissions be offset with sequestration?

Emissions are not directly offset with sequestration. However, farms can enter eligible forests into the NZ ETS to earn NZUs for sequestration, which they can trade on the open market.

How will the revenue from the system be used?

Government intends that any revenue raised would be invested back into the agricultural sector to support further emissions reductions, and this could include paying for sequestration not currently eligible for the NZ ETS (e.g., riparian plantings).

Will rebates be offered in this system?

If agricultural emissions were included in the NZ ETS, processors would initially receive a free allocation of NZUs equal to 95% of their emissions. This means the agricultural sector would initially be exposed to 5% of the costs of their emissions. It is expected that this free allocation would be phased down by one percentage point a year.

Impacts and Insights

The Partnership is completing modelling to better understand the impacts on farm costs and Economic Farm Surplus (EFS) of emissions pricing in the NZ ETS.

Current modelling on the impacts of pricing agricultural emissions in the NZ ETS, assumes a carbon price of \$85/tonne CO₂e in 2025, rising to \$138/tonne in 2030, and starting with a 95% discount (free allocation) that phases down one percentage point a year.

Product costs by sector

- **Dairy sector cost in 2025** is equivalent to \$0.04/kg MS (milk solids). The cost in 2030 is equivalent to \$0.16/kg MS.
- **Sheep, beef, and deer sector cost in 2025** is equivalent to \$0.10/kg sheep meat, \$0.06/kg beef, and \$0.13/kg venison. The cost in 2030 is equivalent to \$0.33/kg sheep meat, \$0.20/kg beef, and \$0.43/kg venison.
- **Fertiliser costs in 2025** is equivalent to \$0.02/kg N. The cost in 2030 is equivalent to \$0.07/kg N.
- These costs are likely to be passed to farms through lower produce prices, or higher product prices for fertiliser.

Impact on Economic Farm Surplus (EFS)

- **The 2025 price** results in <5% impact on EFS for most farms. The impact on EFS is higher for red meat farms than dairy, due to lower emissions intensity for dairy production.
- **The 2030 price** has a much greater impact on EFS. This would potentially impact the viability of some red meat farming systems.
- Red meat farms that are mainly breeding or trading operations face the lowest price under the processor-level ETS system, as much of their stock is sold to finishing properties that send the animal to the processor, although finishing farms may pass the cost on to breeding farmers when purchasing stock.
- The costs associated with the complex management-governance arrangements for Māori land/farms have not yet been included in the analysis and would result in additional operating costs.

Case study farms

Case study analysis on 16 different farm types shows the direct impact of price under the different pricing system options, and the impact on EFS. See Appendix 2 for more detail on the 16 different farm types and the methodology used.

Farm Type	2025 (\$85/tonne CO ₂ e, 95% discount) *		2030 (\$138/tonne CO ₂ e, 90% discount)	
	Price	% change in EFS	Price	% change in EFS
North Island Hill Country	\$ 6,348	-3.2%	\$20,613	-10.2%
North Island Intensive	\$ 6,515	-4.5%	\$21,156	-14.7%
South Island Hill Country	\$ 4,772	-2.5%	\$15,496	-8.3%
South Island Deer	\$ 5,903	-2.6%	\$ 19,168	-8.4%
South Island Mixed Cropping	\$ 7,502	-2.4%	\$24,358	-7.8%
Māori Agribusiness sheep and beef range**	\$10,138-\$18,515	-3.2% - -1.9%	\$32,918 - \$60,119	-6.2% - -10.4%
Canterbury Dairy	\$ 16,850	-1.7%	\$54,712	-5.5%
Taranaki Dairy	\$ 5,683	-1.7%	\$18,452	-5.5%
Waikato/Bay of Plenty Dairy	\$ 6,607	-1.7%	\$21,452	-5.6%
Māori Agribusiness dairy range	\$6,419 - \$10,756	-1.4% - -6.2%	\$20,843 - \$34,925	-4.6% - -20.1%

*Prices in line with Climate Change Commission price assumptions for NZU price.

** Māori Agribusiness sheep and beef case study farms carry more stock units than the other sheep and beef case study farms. See Appendix 2 for more details.

Effect on emissions

- Initial modelling suggests that these prices would lead to reductions in total agricultural emissions of less than 1% reduction in both CH₄ and N₂O below 2017 levels, additional to reductions as a result of other environmental policies.

Recycling Revenue

- At the above prices, the estimated revenue from emissions costs is between \$130-\$430 million per annum.

- Government intends that any revenue raised would be invested back into the agricultural sector to support further emissions reductions, which could include paying for sequestration not currently eligible for the NZ ETS (e.g., riparian plantings). Further emissions reductions could be achieved through recycling revenue.

Modelling outputs are indicative only. The Partnership is continuing to test and improve modelling assumptions.

Administration costs

The NZ ETS backstop has the lowest administration costs of all three options.

Establishment cost is estimated at \$3 million. Set up costs are relatively low as the NZ ETS already exists and would need minimal upgrade and ongoing resourcing to add livestock and fertiliser emissions.

The total operating cost is estimated at \$10 million per annum (\$8 million cost to agricultural processors, and \$2 million for operational costs).

The cost to processors includes time spent reporting and auditing, transaction costs of passing the cost on to farms, and any fees for purchasing the required NZUs.

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He Waka Eke Noa – Split-Gas Levy Approach

For both the farm-level and processor-level hybrid options, a split-gas approach to calculating emissions and setting levy rates has been proposed. This means that different levy rates would be set for short-lived (CH₄) and long-lived (N₂O and CO₂) gases. This approach reflects that CH₄ is not required to reduce to net zero.

Setting the initial levy rates

A core principle of the split-gas approach is recognising the different characteristics of the different gases. The two options for setting the initial levy rates are:

1. Broadly aligned to the NZ ETS carbon price (e.g., NZ ETS carbon price at a set point or period of time); or
2. Unique levy rate based on a consideration of relevant factors.

Requirements to seek advice

The levy rates could be advised on by an advisory body, created or enabled via legislation. Representation on this body could reflect the principles of Te Tiriti o Waitangi and He Waka Eke Noa partners. The advisory body could have responsibility for:

- Providing advice on the setting of the initial levy rates
- Engaging with the sector and wider public on the levy-rate setting process
- Considering a range of factors in setting the levy rates
- Reviewing or updating the levy rates.

Factors to consider in setting or updating levy rates

Setting the levy rates would involve balancing a range of factors that could be set out in the legislation that establishes the levy, to ensure the price level is appropriate to meet the levy's objectives. These could reflect the programme's agreed objectives, which include:

- Incentivises farms to reduce greenhouse gas emissions
- Contributes to meeting New Zealand's targets under the Climate Change Response Act 2002
- Supports a productive, internationally competitive, and sustainable agricultural sector
- Gives affected parties time to modify practices and transition
- Recognises and incentivises integrated on-farm sequestration

Collectives

Groups would be able to register in either of the two He Waka Eke Noa options as a *collective*. A collective is a group that chooses to work together to report their emissions, and potentially to reduce or offset them. This could include processors. This is a key consideration for Māori land that is often owned by whānau, hapū, iwi groupings, trusts and incorporations who may choose to respond in this way as collectives.

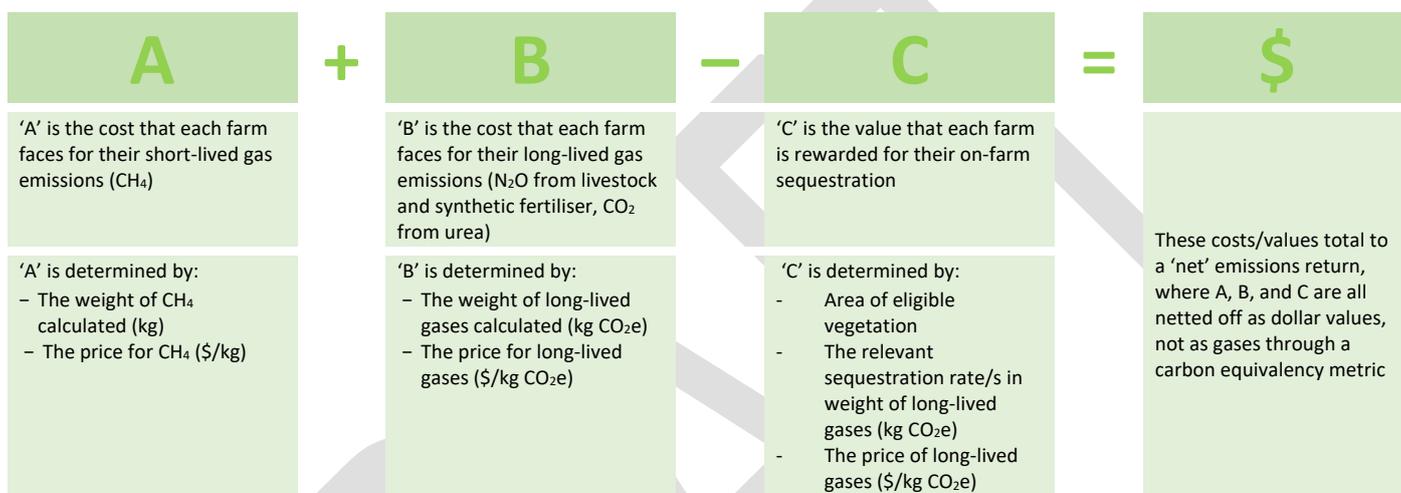
A collective could work alongside a pricing system in several ways. It would allow farm enterprises to link their farms and submit a single return, or for Industry Assurance Programmes to use their current systems to report on behalf of their members. This could involve internal trading within the collective. Reporting would be at the collective level rather than the individual farm.

He Waka Eke Noa – Option 1: Farm-Level Levy

This section outlines how a farm-level levy pricing system could work. This system uses the split-gas approach to price emissions at the farm level. The key features of this option would be:

1. Farms calculate their short- and long-lived gas emissions through a single calculator
2. Actual on-farm emissions determine pricing rather than using national averages
3. On farm efficiencies and mitigations would be recognised as they become available
4. A split-gas approach to pricing would be applied, meaning different levy rates would apply to short- and long-lived gases
5. It would recognise sequestration on-farm which could offset some of the cost of the emissions levy.

The following diagram shows how the net cost to the farm would be calculated under a farm-level levy.



Who is included in the system?

All farms would have to register in the farm-level pricing system if they were GST registered and annually averaged over:

- 550 stock units (sheep, cattle, deer, and goats); or
- 50 dairy cattle; or
- 700 swine (farrow to finish); or
- 50,000 poultry; or
- 40 tonnes of nitrogen through synthetic nitrogen fertiliser application.

This definition captures all farms that emit over 200 tonnes CO₂e per year, which is 96% of all agricultural greenhouse gas emissions (around 23,000 farms). The remaining 4% of emissions are from small lifestyle blocks, orchards, vineyards, and equine.

Who is responsible for reporting and paying for emissions?

The options have been narrowed down to:

1. Landowner (with business owner delegation): The person(s) who own the land would be responsible for reporting and paying for emissions from that land and could choose which areas of sequestration are accounted for. They could formally delegate this responsibility to a business owner who must agree to accept it, OR

2. **Business owner:** The person(s) responsible for the overall operation of the business would be responsible for reporting and paying for the emissions from it. Sequestration could be accounted for with landowner permission.

How are emissions calculated?

The pricing system would use a single centralised calculator to enable a transparent, credible, and consistent approach to calculating emissions. It would use two methods:

- **The simple** method means farms are recognised for a range of improvements in farm management that result in emissions reductions. It applies industry averages to stock classes and combines these with actual farm production data. This option would be easy to complete, less accurate, and more conservative at calculating emissions.
- **The detailed** method captures the emissions reductions options recognised through the simple method plus on-farm efficiencies, and CH₄ and N₂O mitigations from improved animal genetics, forage types, and optimised farm management. This option would take more time to complete but be more accurate and reflect a greater number of on-farm efficiencies and mitigation practices.

Farm inputs for calculation methods	Simple	Detailed
Farm area	√	√
Stock reconciliation	√	√
Milk, meat, wool and velvet production per animal type and class	√	√
Area of farm in different slope classes	√	√
Annual synthetic N fertiliser by type	Annual	Monthly
Synthetic N fertiliser application method (arable/vegetables production only)	√	√
Monthly or quarterly animal numbers by livestock class and age		√
Key farm operations animal number by body weight		√
Time and animal numbers on off-paddock facilities		√
Date of start and end of grazing of different feed types		√
Imported feed		√
Planned start of mating		√
Weaning/post-weaning percentages		√
Effluent/manure application method		√

He Waka Eke Noa is working through the feasibility of a centralised tool that, through an Application Programming Interface (API), allows current tools to automatically input their data and receive outputs. This is how the IRD system operates with different accounting software.

How are emissions priced?

A farm-level system uses the split-gas approach and sets a separate price for biogenic methane (CH₄) and nitrous oxide (N₂O).

The Partnership recommends a unique price for CH₄; and that the price of N₂O, and the value of sequestration are broadly aligned to the NZ ETS carbon price.

A unique rate reflects the different characteristics of CH₄ as a short-lived gas and recognises that CH₄ reductions do not need to get to zero. The price can be tailored to specific CH₄ reductions required.

Aligning long-lived gases to the NZ ETS treats long-lived gases consistently with the price of carbon in the broader economy, and better enables offsetting to achieve a net zero target for long-lived gases.

Work is ongoing to understand the potential for, and impact of phasing in the full cost of N₂O over time and the consequent value of sequestration.

How can emissions be offset with sequestration?

On-farm sequestration, including a number of vegetation types not eligible in the NZ ETS, would be rewarded and farms that choose to would receive a financial offset to their emissions cost. See *Recognising Carbon Sequestration On-farm* for more detail.

How will the revenue from the system be used?

The revenue raised through the levy would be invested back into the agricultural sector to generate further emissions reductions through research and development, incentives to uptake technology, or actions on-farm that help reduce emissions.

Will rebates be offered in this system?

A rebate option could maintain the incentive to reduce emissions while protecting farms from the full cost of emissions. Two main rebate options were considered for the farm-level system: Land-based efficiency (emissions per hectare measured against similar land classes), and output-based efficiency (emissions efficiency per unit for product). The Partnership has decided not to progress these further based on significant issues including implementation of the rebate and the risk of shifting the cost burden to a subset of farms.

Land-Based Option

Under a land-based rebate option, a farm would receive a rebate/assistance based on its land area, adjusted for the average emissions associated with the 'carrying capacity' of the land (with some adjustment made for land improvements).

This option would advantage farms who have been farming within their carrying capacity, or who have not developed their land.

More intensive farms operating above a defined carrying capacity would have a greater proportion of their emissions exposed to a price. This option is challenging to implement primarily because defining carrying capacity requires an understanding of how multiple variables interact and affect carrying capacity on different land/soil types, in different climates, in different sectors, across different years.

The type of land-based rebate explored would need a map created that determines carrying capacity. This would need to be highly accurate across the country and experts in carrying capacity do not have high levels of confidence that this is possible yet.

Output-Based Option

An output-based rebate could only be applied to livestock emissions. Emissions from synthetic fertiliser would be priced through another system. Under an output-based rebate option, a farm would receive a rebate/assistance based on national average efficiency per unit of product.

This option rewards livestock systems that are most emissions efficient per unit of product. This is often (but not always) associated with higher intensity farms, i.e., farms with higher stocking rate and rate of production. Farms that are less emissions efficient per unit of product would face a greater net cost.

The main implementation challenge for an output-based rebate is that not all farms have a final output (such as those who breed or sell to other farms), and so they would not receive a rebate. An effective system would require pass-through of this rebate through the supply chain. While there may be ways to ensure and/or support this, it would add complexity and costs to the system.

Impacts and Insights

The Partnership is completing modelling to understand the impacts of farm-level levy emissions pricing on farm costs. The results provided below are indicative only and we have not yet determined the levy rate for CH₄ or any initial discount on long-lived gases.

The split-gas approach means CH₄ would not be priced at the same rate per tonne of CO₂e, but would be determined and updated following the process and factors outlined in the sections: *Requirements to seek advice* and *Factors to consider in setting or updating levy rates*.

To compare the relative impact of the pricing system on different farm systems, the following shows the indicative costs if the levy rates for CH₄ and the discount for long-lived gases are the equivalent of the NZ ETS backstop. These calculations assume a CH₄ price of \$0.11/kg CH₄, and a long-lived gas price of \$85/tonne CO₂e in 2025 (with a 95% discount).

The product costs and case study costs below do not include:

- The potential offsets farms could gain from additional sequestration, recognised under either He Waka Eke Noa or NZ ETS.
- The reductions in cost that farms could achieve through on-farm practice improvements or future mitigations. It is noted many mitigations will likely only be available after 2030, but these could be significant after that date.

Product costs by sector

- **Dairy sector cost in 2025** is between \$0.04 and \$0.05 kg MS (milk solids).
- **Sheep, beef, and deer sector cost in 2025** is between \$0.09 kg and \$0.19 kg sheep meat, \$0.06 and \$0.29 kg beef, and \$0.21 kg venison. Finishing farms typically have a lower cost, and breeding farms a higher cost.
- **Fertiliser costs in 2025** are between \$0.02 and \$0.05 kg N (mixed cropping).

Impact on Economic Farm Surplus (EFS)

- For some case study farms, the price is slightly lower than the NZ ETS backstop and therefore there is a lower impact on EFS. This is because this option accounts for the actual length of time livestock are present on-farm, and uses emissions factors that relate to individual stock classes. In comparison, the NZ ETS backstop currently uses average emissions factors for individual stock types (species) and average lifespans.
- Other case study farms, e.g., breeding farms such as SI Hill Country and NI Hill Country and some Māori farms, face a higher cost and therefore a greater impact on EFS. In these instances, the cost includes all livestock on-farm, rather than only those sold to processors as under the NZ ETS backstop. These costs would be expected to be passed on through higher livestock prices.

Sequestration

Indicative rewards from additional sequestration recognised under He Waka Eke Noa, based on indicative sequestration rates for each vegetation types and assuming farms receive the full carbon price for this, include:

- Indigenous vegetation established before 1 January 2008, being actively managed: \$156 per hectare in 2025
- Indigenous vegetation established on or after 1 January 2008: \$552 per hectare in 2025
- Riparian vegetation: \$238 per hectare in 2025
- More detail on these and other categories is in the section *Recognising Carbon Sequestration on-farm*.

Further analysis is needed on which farm systems would benefit most from sequestration opportunities, but it has been identified that some SI Hill Country farms would likely have fewer sequestration opportunities than other sheep and beef systems due to drier climates and land-use restrictions.

Case study farms

The table below shows emissions prices that would be faced by the 16 case study farm types, assuming the price of CH₄ is the same as under the NZ ETS.

See Appendix 2 for more detail on the 16 different farm types and the methodology used.

Farm Type	2025 (\$0.11/kg CH ₄ and \$85/tonne CO ₂ e long lived with 95% discount) *	
	Price	% change in EFS
North Island Hill Country	\$7,174	-3.6%
North Island Intensive	\$5,010	-3.5%
South Island Hill Country	\$11,195	-6.0%
South Island Deer	\$11,305	-5.0%
South Island Mixed Cropping	\$4,549	-1.4%
Māori Agribusiness Sheep + Beef range**	\$12,774 to 22,451	-2.6 to -3.1%
Canterbury Dairy	\$12,966	-1.3%
Taranaki Dairy	\$4,878	-1.5%
Waikato/Bay of Plenty Dairy	\$6,195	-1.6%
Māori Agribusiness Dairy range	\$6,334 to \$9,224	-1.2% to -6.1%

*Prices are in line with Climate Change Commission price assumptions for NZU price.

**Māori Agribusiness sheep and beef case study farms carry more stock units than the other sheep and beef case study farms. See Appendix 2 for more details.

Effect on emissions

Initial modelling suggests these prices would lead to reductions in total agricultural emissions of less than 1% reduction in both CH₄ and N₂O below 2017 levels, additional to reductions as a result of other environmental policies.

These reductions are based on pricing alone. The majority of emissions reductions are expected to be achieved through recycling revenue into research and development, incentives to uptake technology, or actions on-farm that help reduce emissions.

Recycling revenue

A farm-level split-gas levy would raise revenue. Emissions costs are directly financially offset by on-farm sequestration recognised in the system: Emissions price less sequestration = net revenue raised. At the above prices, the estimated revenue from emissions costs is \$137 million per annum. This is before the financial offset from sequestration, which could be considerable with initial modelling suggesting an annual value of sequestration could be as high as \$82M per annum.

Emissions costs could be higher or lower depending on the range of factors set out in *Factors to consider in setting or updating levy rates*. Estimates of eligible sequestration for modelling purposes are currently being refined.

The following table illustrates the activities revenue could be recycled into and potential associated costs.

Areas for recycle revenue	Amount
Research and development into mitigation technologies and practices	Still to be decided. Work underway on Research and Development Strategy that could inform this, including consideration of current investment by Government and sector.
Action to reduce emissions e.g. payments for use of methane inhibitors, vaccine, low emissions genetics	Still to be decided. Would be informed by availability of technology and level of emissions reductions sought.
Administration costs	Still to be decided. Would be informed by principles of cost share between Government and participants. Work underway to develop agreed principles. Range of between 0-\$50 million/annum for operations and 0-\$143 million for establishment (see section <i>Administration costs</i> below for details).

Modelling outputs are indicative only. The Partnership is continuing to test and improve modelling assumptions.

Administration costs

Administration costs would be highest for establishing and implementing a farm-level pricing system. The implementation agency would incur capital costs upfront for the scope and build of the farm-level pricing system. Post-2025, the focus would move to operation including registration, reporting, levy payment, audit, and compliance.

The total operating costs are estimated to be around \$113 million per annum (\$63 million cost to farmers in time spent reporting and \$50 million for operational costs) and establishment cost is estimated at \$142 million.

Farm participant costs would start from 2024 when they start reporting emissions, and are a result of the time and effort required to measure and report emissions and sequestration, alongside audit costs:

- For the simple method, recording data is estimated to take five hours for a dairy farm and 25 hours for a sheep, beef, and deer farm.
- For the detailed method, recording data is estimated to take 10 hours for a dairy farm and 50 to 100 for a sheep, beef, and deer farm.
- For cropping farms with no livestock, fertiliser only, it is estimated to take around five hours for both methods.

The Partnership is doing further work on how to reduce the time spent recording data, including looking at what information would already be collected by 2025 for He Waka Eke Noa milestones to know your number, and have a plan, and for Freshwater Farm Planning.

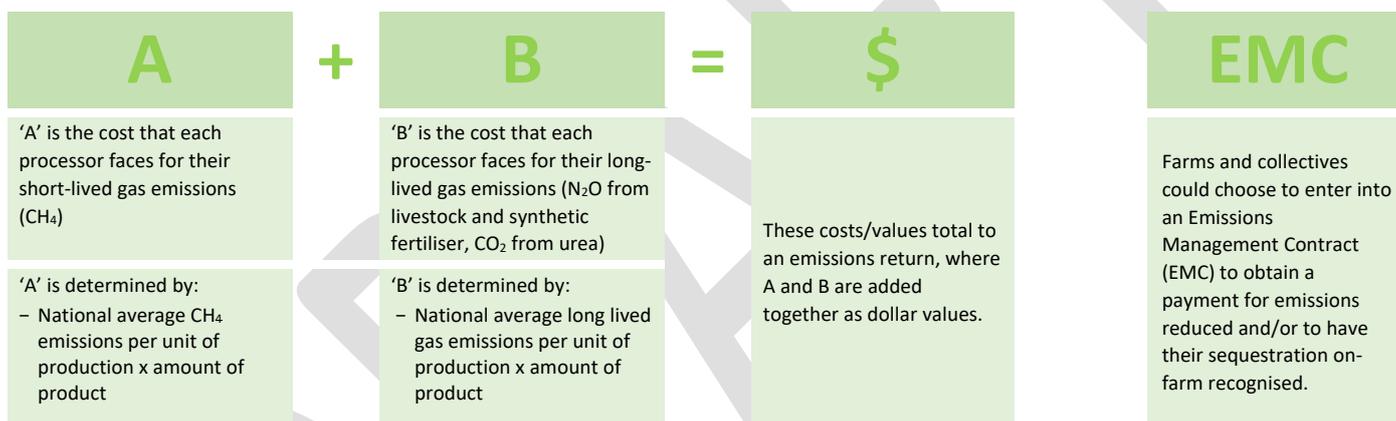
He Waka Eke Noa – Option 2: Processor-Level Hybrid Levy

This section outlines how a processor-level hybrid pricing system could work. The key features of this options are:

1. Processors would pay for emissions based on the emissions charge applied to products supplied, or bought (fertiliser), by farmers or growers. Processors would likely pass on the cost to farms based on the quantity of product processed, or fertiliser bought.
2. There would be separate emissions charges for short- and long-lived gases.
3. Farms individually or in collectives could receive a payment for emissions reductions if they choose to enter into an Emissions Management Contract (EMC). This would be a voluntary process, but once established the contracts would be binding.
4. Farms could also receive a payment for sequestration, on the basis of an agreed EMC. This would be a voluntary process, but once established the contracts would be binding.

An EMC would provide an incentive for farms or collectives to reduce emissions, and maintain and increase sequestration, through receiving a payment that goes some way toward offsetting the costs that they would receive via the processor.

The following diagram shows how the net cost to the farm would be calculated under a processor-level hybrid levy.



Who is responsible for reporting and paying for emissions?

Processors (meat and dairy) and fertiliser manufacturers and importers would be responsible for reporting and paying for emissions, based on the emissions charge applied to products supplied or bought by farmers or growers.

Farm-level reporting may be required for farms or collectives that choose to enter an EMC and receive a payment for emissions reductions and sequestration.

How are emissions calculated?

Emissions would be calculated using national average emissions factors for relevant products, e.g., milk, meat, and synthetic fertiliser. They would be applied per kg of product produced and per tonne of synthetic fertiliser sold.

Individual farms emissions would need to be calculated if they chose to apply for a farm-level EMC. See *Emissions Management Contracts (EMC)* below for further detail.

How are emissions priced?

Two unique levy rates would be set for emissions: one for short-lived gas emissions (CH₄), and one for long-lived gas emissions (N₂O and CO₂).

More work is required to establish how the price would be set for sequestration for the farms or collectives that choose to enter into an EMC.

How can emissions be offset with sequestration?

Individual farms or collectives could only seek recognition for sequestration by entering into an EMC. The same categories and considerations would apply as under a farm-level system. See *Recognising Carbon Sequestration On-Farm* for more detail.

How will the revenue from the system be used?

Any revenue raised through the levy would be invested back into the agricultural sector to reward on-farm actions that help reduce emissions, provide incentives to uptake technology, or to support research and development on future emissions reduction technology and practice. One option considered for revenue recycling is through an EMC (see *Emissions Management Contracts (EMC)* below for more detail).

Will rebates be offered in this system?

The processor-level hybrid levy doesn't include a direct rebate, but payments would be offered through an EMC.

Emissions Management Contracts (EMC)

An Emissions Management Contract (EMC) would be a binding contract for a fixed time. Farms or collectives could enter an EMC to be rewarded for formally managing and reducing their emissions and adopting new mitigation technologies as they become available.

An EMC could also seek to recognise and reward on-farm sequestration. We are still working through if there would be separate EMCs for sequestration, or if sequestration and action to reduce emissions would be part of a single contract.

An EMC would give farms and collectives the opportunity to receive revenue to offset some of the costs of the emissions charges that would be passed on by processors. A Farm Plan may be the basis for a farm or collective to understand the potential actions that could be undertaken to reduce or offset emissions. Based on this, farms or collectives could decide if signing up to an EMC would benefit them.

More work is underway on exactly what an EMC would recognise (e.g., mitigation technology, changing farm practice) and how this would be managed.

There are several potential approaches for supporting farmer action through an EMC:

1. An outcomes-based approach would measure and track emissions reductions. A starting point or benchmark for each farm or collective may need to be established.
2. A behaviour-based approach would see farms receiving credit for activities undertaken, rather than emissions reductions achieved.
3. A combination of both of these approaches.

The steps below show the possible process of establishing an EMC.

STEP 1:	The farm or collective determines potential benefits of applying for credit for actions to reduce emissions, weighing up the cost of the processor levy to the business, the cost of developing an EMC, mitigations available, and the impact on profit/production of reducing emissions.
STEP 2:	If farm or collective sees a net benefit, they make an application to the administrator for an EMC.
STEP 3:	Administrator assesses the application, and contracts the commitment (if the criteria were met and funds were available).
STEP 4:	The farm or collective makes the changes and records the actions.
STEP 5:	Administrator verifies changes and provides payment based on contract conditions.

Impacts, Insights, and Administration costs

The Partnership is in the process of modelling the impacts of the processor-level hybrid levy option on emissions, profit, production, emissions per unit of production, and system costs.

The split-gas approach means levy rates for CH₄ and long-lived gases under this option would not be aligned to the NZ ETS carbon price, but would be determined and updated following the process and factors outlined in the sections *Requirements to seek advice* and *Factors to consider in setting or updating levy rates*.

To compare the relative impact of the pricing system on different farm systems, if the prices were the equivalent of the NZ ETS backstop i.e., CH₄ price of \$0.11/kg CH₄, and a long-lived gas price of \$85/tonne CO₂e in 2025 (with a 95% discount), the costs would be the same as the NZ ETS backstop (as shown below). This table does not include any payment available through an EMC that would indirectly offset the costs of the processor-level levy.

Farm Type	2025 (\$0.11/kg CH ₄ and \$85/tonne CO ₂ e long lived with 95% discount) *	
	Price	% change in EFS
North Island Hill Country	\$ 6,348	-3.2%
North Island Intensive	\$ 6,515	-4.5%
South Island Hill Country	\$ 4,772	-2.5%
South Island Deer	\$ 5,903	-2.6%
South Island Mixed Cropping	\$ 7,502	-2.4%
Māori Agribusiness sheep and beef range**	\$10,138-\$18,515	-3.2% - -1.9%
Canterbury Dairy	\$ 16,850	-1.7%
Taranaki Dairy	\$ 5,683	-1.7%
Waikato/Bay of Plenty Dairy	\$ 6,607	-1.7%
Māori Agribusiness dairy range	\$6,419 - \$10,756	-1.4% - -6.2%

*Prices in line with Climate Change Commission price assumptions for NZU price.

** Māori Agribusiness sheep and beef case study farms carry more stock units than the other sheep and beef case study farms. See Appendix 2 for more details.

Effect on emissions

Initial modelling suggests these prices would lead to reductions in total agricultural emissions of less than 1% reduction in CH₄ and N₂O below 2017 levels, additional to the reductions as a result of other environmental policy.

These reductions are based on pricing alone. The majority of emissions reductions are expected to be achieved through recycling revenue into research and development, incentives to uptake technology, or actions on-farm that help reduce emissions.

Recycling revenue

At the assumed prices described above, a processor-level split-gas levy would raise revenue of around \$137 million per annum.

The emissions price, value of sequestration, and revenue raised are indicative only. These could be higher or lower depending on the range of factors set out in *Factors to consider in setting or updating levy rates*.

The following table illustrates the activities revenue could be recycled into, and potential associated costs.

Areas for recycle revenue	Amount
Research and development into mitigation technologies and practices	Still to be decided. Work underway on Research and Development Strategy to inform this, including consideration of current investment by government and sector.
Sequestration via EMC	Estimates of eligible sequestration for modelling purposes currently being refined, this could be considerable, with initial modelling suggesting an annual value of sequestration could be as high as \$82M/yr.
Action to reduce emissions via EMC	Still to be decided. Would be informed by availability of technology and level of emissions reductions sought. Work ongoing to determine the value of payment that would apply to any emissions management/reductions and sequestration.
Administration costs	Still to be decided. Would be informed by principles of cost share between government and participants. Work underway to develop agreed principles. Would likely be lower than farm-level administration costs.

Modelling outputs are indicative only. The Partnership is continuing to test and improve modelling assumptions.

This option could be a transition to a farm-level system in the future once more mitigations and technologies are available to farmers.

Recognising Carbon Sequestration On-Farm

The farm-level levy or processor-level hybrid levy pricing systems would offer farms the ability to recognise sequestration from some on-farm vegetation. This would give farms a way to offset some of the financial liability from their emissions.

Some basic principles are useful to understand the Partnership recommendations for recognising sequestration:

- The faster trees grow, the faster carbon is accumulated. Typically, exotic trees grow faster than indigenous trees. However, unharvested forests (i.e., native forests) store more carbon than clear-fell plantations over the long-term.
- For a given type of vegetation at a particular location, two broad factors impact sequestration: the stage of growth, and the way it is managed.
- The amount of carbon that different vegetation types sequester is finite.
- When vegetation is removed, it can become a source of emissions. All vegetation types that are recognised would need to be maintained in vegetation or face a liability if they are cleared (permanent categories) or cleared and not replanted (cyclical categories).

What categories of vegetation can farmers and growers be rewarded for?

Through the pricing system, farms could choose to enter many types of vegetation not currently eligible for the NZ ETS. These vegetation types fall into two broad categories: permanent and cyclical.

Permanent vegetation includes planted or regenerated indigenous/native vegetation that would not be harvested and is generally self-sustaining through self-seeding. Land must remain in permanent vegetation and not be cleared. Categories include:

- a) Indigenous vegetation established before 1 January 2008: At least 0.25ha of land wholly or predominantly in indigenous woody vegetation¹ either planted, regenerated, or a combination. Stock must be excluded from the area. For regenerating, a seed source needs to exist within 100m radius from centre of vegetation area.
- b) Indigenous vegetation established on or after 1 January 2008 and was also not forested at or prior to 1 January 1990: At least 0.25ha of land wholly or predominantly in indigenous woody vegetation either planted, regenerated, or a combination, that was in pasture prior to 1 January 2008. For regenerating, a seed source needs to exist within 100m radius from centre of vegetation area. Note the proof required for whether the land was forested prior to 1990 is likely to be in the form of a declaration by the landowner, but this is still to be determined.
- c) Riparian vegetation established on or after 1 January 2008: Plantings suited to margins and banks of waterways including wetlands, minimum of 1m wide from the edge of the bank of the waterway/wetland. Predominantly woody vegetation including indigenous and/or a mix of non-indigenous plants used for environmental benefit. Non-woody vegetation such as flaxes and toetoe are included but must not be the predominant species.

NZ ETS-eligible indigenous forest would be eligible to be entered into the pricing system.

Cyclical vegetation is defined as vegetation that is planted and may be felled and re-established. This kind of forest is not self-sustaining and needs to be replanted to ensure its continuation. To be eligible for the system, all cyclical categories must have been planted on or after 1 January 2008. Categories include:

- a) Perennial Cropland: At least 0.25ha of orchards and vineyards, associated with perennial cropland planted on or after 1 January 2008.

¹ indigenous woody vegetation: gorse/broom (as a nursery crop for indigenous species), manuka and/or kanuka, matagouri or grey scrub, fernland, kahikatea, swamp maire, five finger, coprosma, wineberry, lemonwood, cabbage trees, etc.

- b) Scattered forest: Minimum of 0.25ha for any area counted with minimum stocking rate of 15 stems per hectare. May include shelterbelts. Scattered forest is not eligible if it is >1ha, and >30% canopy cover at maturity, and >30m wide (i.e., once it meets the NZ ETS criteria).
- c) Woodlots/tree-lots: Up to 1ha and at least 0.25ha of tree species that have greater than 30% canopy cover.

NZ ETS-eligible exotic forest would not be eligible for the pricing system, as it can already be recognised through the NZ ETS. The Partnership aims to avoid creating further incentive for planting exotic forests.

How will farmers and growers be rewarded for their on-farm sequestration?

The farm-level or processor-level hybrid systems would recognise sequestration on-farm by following the international accounting approach of 'additionality'. This means only 'new' or above 'business-as-usual' sequestration is rewarded. This approach ensures environmental integrity when using carbon removals or offsets to meet climate targets. Additionality is usually determined by setting a year as baseline.

The system would reward sequestration by following the additionality approach in two ways:

1. Setting a baseline year so any sequestration in new vegetation established on or after 1 January 2008 is considered additional.
2. Setting a baseline of 'business-as-usual management' so that any sequestration associated with ecological/vegetation management is considered additional. The use of this baseline allows recognition of vegetation established prior to 1990.

How will sequestration from permanent categories be calculated?

Indigenous vegetation established before 1 January 2008 would be rewarded with an annual rate based on additional sequestration from management action. Farmers would need to provide proof of active management (stock exclusion). The amount of sequestration rewarded would depend on the age and state of the vegetation.

Indigenous vegetation established after 1 January 2008 would be rewarded with an annual sequestration rate based on yearly accumulation of carbon.

There would be no area limit for how much permanent vegetation could be recognised, as long as it met the definition.

How will sequestration from cyclical categories be calculated?

Cyclical vegetation would be rewarded by recognising the long-term average carbon stock. This is the average carbon after considering losses from harvesting and gains from replanting. There would be different sequestration rates and long-term averages for different vegetation types.

Any cyclical vegetation eligible for the NZ ETS would not be eligible for this system.

What if my sequestration is greater than my emissions?

For most farms or collectives, the areas of eligible sequestration are unlikely to be greater than emissions. For the small number of farms where sequestration may be greater than emissions, He Waka Eke Noa is considering: providing a credit to be used against future liabilities; a financial payment; or capping the value of sequestration to not exceed emissions.

How are Te Ao Māori interests and values recognised?

The Partnership recognises that Māori have a unique relationship with the natural world and place significant cultural value on indigenous vegetation. Many species are considered taonga, are sources of food, traditional medicine, and indicators of a healthy environment. Respect and caring for indigenous vegetation is central to the interconnected relationship Māori have with these taonga.

Considering policy design through a Te Ao Māori perspective aims to help identify what this could look like in practice. There is ongoing work to ensure cultural values and practices are integrated within the new system.

What if I remove vegetation/deforest?

When vegetation is removed, it can become a source of emissions. Vegetation recognised for sequestration in the system would face liabilities and compliance penalties if this vegetation was cleared. Cyclical vegetation would only face liabilities and compliance penalties if the vegetation was not replanted.

What if there is an adverse event like a flood, drought, or earthquake, that damages my vegetation?

If an area of vegetation were significantly damaged or destroyed by an adverse event, the farm would not face any penalty, but would no longer receive recognition for the sequestration in that area until it reached the same state it was in prior to the adverse event.

Will carbon stored in soil be recognised?

Soil carbon would not be recognised by the pricing system, although it may be recognised in the future. Soil scientists have concluded that it should be possible to include changes in soil carbon in a pricing system in the future if adequate investment is made into research and development, but current scientific knowledge is not sufficient.

What choices will a farmer or grower need to make?

Farms could choose whether to enter NZ ETS eligible indigenous vegetation into the system or NZ ETS. They could not enter the same area of vegetation into both systems.

Farms would also need to decide what on-farm vegetation they want to be recognised. There would be liabilities associated with removing any recognised vegetation.

Comparison of sequestration currently in NZ ETS and proposed in the new pricing system.

Type of Vegetation	NZ ETS	He Waka Eke Noa
Exotic forest: more than 1ha exotic, 30 metre canopies	Eligible	Not eligible
Perennial cropland: at least 0.25ha orchards & vineyards, associated with perennial cropland planted on or after 1 January 2008	Not eligible	Eligible
Small woodlots: up to 1ha and at least 0.25ha of tree species with greater than 30% canopy cover, planted on or after 1 January 2008.	Not eligible	Eligible
Scattered trees: minimum of 0.25ha for any area counted with min stocking rate of 15 stems/ha planted on or after 1 January 2008. May include shelterbelts.	Not eligible	Eligible
Indigenous vegetation post-1989	Eligible: post-1989 native forest can be registered in NZ ETS, proof needed the land not in forest prior to 1 January 1990.	Eligible: indigenous vegetation planted on or after 1 January 2008 rewarded with annual sequestration rate based on yearly accumulation of carbon. Indigenous vegetation planted before 1 January 2008 would be rewarded with an annual rate based on additional sequestration from management action.
Indigenous vegetation pre-1990	Not eligible	Eligible with reward for active management of vegetation.
Riparian	Not eligible	Eligible

Summary of options

	Backstop: Agriculture in the NZ ETS	Option 1: Farm-Level Levy	Option 2: Processor-Level Hybrid Levy
Who is responsible for reporting and paying for emissions?	Meat and dairy processors, synthetic N-fertiliser manufacturers/importers.	Farms that meet the farm definition either individually or as part of a collective.	Meat and dairy processors, synthetic N-fertiliser manufacturers/importers. Farms and collectives can apply for payments via an Emission Management Contract (EMC).
How are emissions calculated?	Tonnes product (meat, milk solids, synthetic N-fertiliser) multiplied by a national emissions factor to determine emissions per unit of product (output).	Central calculator that includes a simple and detailed method to determine actual emissions at farm-level.	Tonnes product (meat, milk solids, synthetic N-fertiliser) multiplied by a national emissions factor to determine emissions per unit of product (output).
How are emissions priced?	Participants pay the carbon price of the day in NZ ETS by purchasing and surrendering NZUs, but also receive 95% free allocation, that reduces by 1 percentage point each year	Unique levy rate for CH ₄ and N ₂ O broadly aligned to NZ ETS carbon price. Ministers responsible for setting the levy seek and consider the advice of an external advisory group.	Unique levy rate for CH ₄ and N ₂ O. Minister/s responsible for setting the levy seek and consider the advice of an external advisory group.
How can emissions be offset with sequestration?	NZ ETS eligible forests can be entered into the existing NZ ETS.	Emissions are directly offset by sequestration from some vegetation types not included in NZ ETS. This includes: <ul style="list-style-type: none"> • Indigenous/native vegetation planted or regenerating vegetation • Perennial cropland (orchards and vineyards) • Scattered trees and small woodlots established on or after 1 January 2008 that are not NZ ETS eligible exotic forest. 	Rewards sequestration from vegetation types as described in Option 1 through an Emissions Management Contract (EMC).
How will the revenue from the system be used?	Government intends that any revenue raised through the backstop would be invested back into the agricultural sector to support further emissions reductions. This could include paying for sequestration not eligible for the NZ ETS (e.g., riparian plantings).	The revenue raised through the levy would be invested back into the agricultural sector to generate further emissions reductions through research and development or actions on-farm that help reduce emissions including uptake of new technology.	The revenue raised through the levy would be invested back into the agricultural sector to generate further emissions reductions through research and development or to reward actions on-farm that help reduce emissions via an EMC.
Key advantages	Low-cost system to administer/collect revenue.	Treats CH ₄ and N ₂ O differently. Farms who have taken early action to reduce emissions will face a lower emissions cost because emission reductions from on-farm efficiencies and mitigations are recognised in the	Low-cost system to collect revenue. Treats CH ₄ and N ₂ O differently. EMCs could make a processor-level price more effective at reducing emissions, and recognise efficiencies and mitigations taken up by farms.

		<p>tool to calculate on farm emissions.</p> <p>Farms who have taken early action to maintain and increase sequestration will be rewarded because recognised sequestration includes that associated with existing vegetation (if it meets He Waka Eke Noa requirements).</p>	<p>Provides a transitional step towards a farm-level pricing system.</p> <p>Farms who have taken early action to maintain and increase sequestration can be rewarded via an EMC because this includes recognising sequestration associated with existing vegetation (if it meets He Waka Eke Noa requirements).</p>
Backstop: Agriculture in the NZ ETS		Option 1: Farm-Level Levy	Option 2: Processor-Level Hybrid Levy
Key disadvantages	<p>Does not treat CH₄ and N₂O differently so misaligns with emissions targets.</p> <p>No control over price.</p> <p>Does not recognise individual farms for actions they take to reduce emissions.</p> <p>A processor-level price is blunt and is unlikely to be effective at reducing emissions, but the revenue raised would be redirected into initiatives to help reduce sector emissions.</p>	<p>Setting an affordable price for all farms is unlikely to be effective at reducing emissions but the revenue raised would be redirected into initiatives to help reduce sector emissions.</p> <p>Potential to use rebates to maintain an incentive to reduce emissions with a lower net price but to date no practical and equitable rebates have been identified.</p> <p>High cost to administer both to farms (mostly in time) and implementing agency.</p>	<p>A processor-level price signal is blunt and does not recognise individual farms for the actions they take to reduce emissions.</p> <p>Price is unlikely to be effective at reducing emissions, but the revenue raised would be redirected into initiatives to help reduce sector emissions.</p> <p>There is potential for Emissions Reduction Contract (EMC) to recognise farms who have taken early action to reduce emissions, however, to be effective at incentivising emission reductions EMCs may require a benchmark from which to measure change. This could disadvantage those who have taken early action to reduce prior to the benchmark. The detail of how this could work is still being worked through.</p>

Appendix 1: Other options considered for farm-level pricing

Option considered	Description	Key considerations/reasons for not progressing
Baseline and credit levy	<p>Participants would face a penalty or incentive, based on a performance baseline.</p> <p>Farms that don't meet the baseline would incur a penalty while farms that exceed it would receive a credit.</p> <p>The baselines would be regularly revised to recognise changes in emissions performance levels.</p>	<p>The main disadvantage is how to determine the performance baseline.</p> <p>If the performance baseline is determined by outputs (milk/meat) efficiency, then farms such as breeding operations and store farms would be excluded.</p>
Single-market cap and trade scheme	<p>Farms would participate in a separate agricultural trading scheme to the NZ ETS.</p> <p>A single cap for emissions would be set with all gases converted to CO₂e using GWP₁₀₀.</p> <p>Farms would surrender units for the agricultural greenhouse gases they emit within a given period. It would be up to the emitter to decide whether to reduce their emissions or purchase units.</p> <p>The price the emitter pays for units would be set by supply and demand within the market.</p>	<p>The main disadvantage was cost and complexity for farms.</p> <p>Farms would be required to engage with and learn an unfamiliar system.</p> <p>A requirement to trade units adds cost, complexity, and risk for farms.</p>
Split-market cap and trade scheme	<p>Farms would participate in a separate agricultural trading scheme to the NZ ETS.</p> <p>Two caps would be set: one for long-lived gases, and one for short-lived gases.</p> <p>Farms would surrender separate units for CO₂ and N₂O emitted within a given period.</p> <p>It would be up to the emitter to decide whether to reduce their emissions or purchase units.</p> <p>The price the emitter pays would be set by supply and demand within the market.</p>	<p>While this option allowed for a split-gas approach it still posed cost and complexity challenges.</p> <p>In addition to the challenges associated with a single-market cap and trade, farms would trade two different types of units, with two prices driven by the two different caps.</p> <p>This creates additional administrative cost and complexity.</p>
Good Management Practice (GMP) based levy	<p>Farms could opt to adopt good management practices or technologies or incur a cost relative to the emissions reduction which would have occurred if this action had been adopted.</p> <p>If a mitigation exists that has the potential to reduce on-farm emissions by a large amount, the farm would face a correspondingly large levy cost.</p> <p>However, if no mitigations were available to the farm, no cost exposure results.</p>	<p>A core disadvantage of this approach is in defining 'good management practice' and implementing this in practice.</p> <p>The principle of recognising GMP could be achieved when farms adopt mitigations/apply GMPs to reduce emissions and it is reflected in the emissions calculation for A and B (i.e., lower emissions), and good practice through increasing sequestration is recognised through defining 'C'.</p> <p>GMP is also supported through inclusion of greenhouse gases in farm planning.</p>

Appendix 2: Case study farm description and methodology

Sixteen farm systems show the financial impacts of a range of pricing systems and price settings, as well as on-farm efficiency gains that could reduce emissions. These are representative farm models constructed in Farmax, based on the B+LNZ Economic Service data for the sheep and beef farms, and DairyNZ statistics for the dairy farms. The Māori farm case studies are based on actual farms which include six trusts, and two incorporations. Two of the trusts are administered by Te Tumu Paeroa. At this stage, where multiple land uses exist within the larger-scale entities, only one has been reflected in the case study. The range of impacts across these entities for each sector are presented in this document.

All farms were modelled using Farmax except for the South Island mixed cropping farm (based on an actual farm), noting Farmax doesn't suitably model crop production. Model outputs include:

- Agricultural GHG levy price
- Price impact on milk solids, beef, sheep meat, venison, and N-fertiliser
- Farm EFS less the levy price, and levy price and mean debt
- Percentage farm EFS change after levy price.

Sheep, Beef and Deer Farms		North Island Hill Country	North Island Intensive	South Island Hill Country	South Island Deer	South Island Mixed Cropping	Māori Agribusiness Sheep and Beef 1	Māori Agribusiness Sheep and Beef 2	Māori Agribusiness Sheep and Beef 3
Description		Breeding and finishing operation.	Sheep and cattle breeding and finishing operation with only a small percentage of lambs finished. Steers, a techno bull-beef and yearling dairy grazers (May to May contract).		The farm is the same as South Island Hill Country but with the sheep and beef operation scaled back to 53% of the operation and 47% deer. The model used 5-year average for schedule and velvet prices.	On the plains and irrigated by pivot and lateral spray irrigation. Soils are versatile, of optimum fertility, free draining and suitable for intensive cropping (LUC 1 & 2).	Central North Island sheep and beef farm with breeding ewes, finishing cattle and dairy grazers.	Breeding operation including breeding ewes and cattle.	Breeding operation including breeding ewes and cattle.
Area		Total area of 525ha with 507ha effective, including 53ha flats, 238ha rolling hills and 234ha steep.	Total area of 290ha with 278ha effective, mostly flats.	Total area of 1,562ha with 1,532ha effective, including 200ha flats, 409ha rolling, 326ha steep and 627ha tussock.	Total area of 1,562ha with 1,532ha effective, including 200ha flats, 409ha rolling, 326ha steep and 627ha tussock.	Total area of 261ha with 245ha effective	Total area of 966ha with 908ha effective.	Total area of 1,079ha with 750ha effective.	Total area of 1,459ha with 1,153ha effective
Livestock - Sheep	Ewe Hogget	420	420	969	485		820	495	1,600
	MA Ewes	1,680	660	3,591	1,796	250	2,200	1,274	5,345
	Lambs (weaned)	2,127	939	4,434	2,216	2,600			
	Rams	25	10	36	18		30	12	85
	Mixed Hogget						40	1,017	
	Mixed Sheep						20		
Total Sheep		4,252	2,029	9,030	4,515	2,850	3,110	2,798	7,030
Livestock - Beef	MA Cows	157		279	140				270
	Dairy Grazers		90						
	Heifer Calves	79		150	75				
	1-year Heifers	78		69	35		689		144
	2-year Heifers	37		67	34				144
	Steer Calves	79	90	150	75				
	1-year Steers	77	89					14	97
	2-year Steers	78	90					69	95
	Bulls								13
	Breeding Bulls	4		6	3				
	Bull Calves		120						
	1-year Bulls		119				182	216	50
2-year Bulls		118				148	636		
Total Beef		589	716	721	362		1,019	935	813
Livestock - Deer	Hinds				900				
	2-year Hinds				185				
	1-year Hinds				190				

Sheep, Beef and Deer Farms		North Island Hill Country	North Island Intensive	South Island Hill Country	South Island Deer	South Island Mixed Cropping	Māori Agribusiness Sheep and Beef 1	Māori Agribusiness Sheep and Beef 2	Māori Agribusiness Sheep and Beef 3
	Hind Fawns (weaned)				280				
	Stag Fawns (weaned)				280				
	1-year Stags (sold)				230				
	Breeding Stags				29				
	Total Deer				1,865				
Livestock – Velvetting stags	1-year Stags				50				
	2-year Stags				45				
	MA Stags				200				
	Total Stags				295				
Crops grown	Wheat					10.5 t/ha			
	Barley					8 t/ha			
	Ryegrass seed					2,480 kg/ha			
	Peas - garden					5 t/ha			
	Clover					1,000 kg/ha			
N-Fertiliser (kgN/ha)	7	21	3	3	215	6	10	0	
Notes	All lambs are finished, except replacements. Lambing percentage is 130%. All steers are kept and sold as two-year olds and all heifers are sold at 20 months, except for 25% replacements.	Lambing percentage is 145%. All lambs are sold prime. Steers bought at seven months and fattened to 2.5 years; bull calves bought at four months and fattened to the same age.	MA cows grazed on tussock and brought down for calving (Sept to Jan). MA ewes grazed on tussock from mid-January until the beginning of April. Lambing percentage is 128%. 27% of lambs sold prime the rest store. All calves except replacements sold as weaners.	Lambing percentage is 128%. The surplus weaner hinds are sold at weaning while the weaner stags are kept and sold the following spring.	Lambing percentage is 180%. 60% of total annual farm revenue is earned from crop sales 40% from lamb finishing and trading. Breeding ewes used to manage crop residue and strategic grazing of crops	Lambing percentage is 134%.	Lambing percentage is 130%	Lambing percentage is 130%	
Feed	Supplements made include 10ha (30 tonnes) of swedes/kale, 10ha (8 tonnes) of leafy turnips (8t/ha), and 240 bales of baleage.	Supplements made include 12ha (108 tonnes) of plantain and 610 bales of baleage.	Supplements made include 20ha (90 tonnes) of swedes and 600 bales of baleage.	All other aspects of the farm system are the same apart from an additional 10t of oat grain bought in.	No supplement imported.	Supplements made include 17ha (162 tonnes) Chou and 42ha (126 tonnes) pasture silage.	No supplements are made or bought.	A total of 57ha of forage crops are grown and fed on farm. No supplements are made or bought.	
Economic Farm Surplus	\$201,176 or \$397/ha	\$144,063 or \$518/ha	\$187,327 or \$122/ha	\$228,268 or \$149/ha	\$314,253 or \$1,283/ha	\$529,585 or \$583/ha	\$494,397 or \$659/ha	\$731,113 or \$634/ha	

Dairy Farms		Canterbury	Taranaki	Waikato/Bay of Plenty	Māori Agribusiness Dairy 1	Māori Agribusiness Dairy 2	Māori Agribusiness Dairy 3	Māori Agribusiness Dairy 4	Māori Agribusiness Dairy 5
Area		Total area of 240ha with 233ha effective, and effluent block of 86ha.	Total area of 112ha with 107ha effective.	Total area of 136ha with 131ha effective.	Total area of 213ha with 204ha effective.	Total area of 160ha with 153ha effective.	Total area of 190ha with 170ha effective.	Total area of 480ha with 234ha effective.	Total area of 267ha with 219ha effective.
Livestock - Dairy	MA Cows	809	298	373	610	450	515	600	599
	1-year Heifers	182	64						
	Heifer Calves (born)	186	65	81					
	Bobby Calves (sold)	623	227	289					
KgMS	349,135	118,296	134,925	223,264	132,403	183,483	165,318	192,362	
N-Fertiliser (kgN/ha)	163	139	120	56	87	150	34	134	
Notes	Heifers are grazed on farm.	Heifers are grazed on farm.	Heifers are grazed off farm.	Heifers grazed off farm.	Heifers are grazed off farm.	Heifers are wintered on farm.	Heifers grazed off farm.	Heifers are grazed off farm.	

Feed	215 tonnes of silage, 145 tonnes of barley grain and 5.7 tonnes of calf meal are bought. Supplements made include 200 tonnes of fodder beet and 13 tonnes of pasture silage.	Supplements made include 72 tonnes of turnips and 62.5 tonnes of pasture silage. 113 tonnes of maize silage, 42 tonnes of hay, 49.8 tonnes of Palm Kernel Expeller, 19.3 tonnes of Distillers Grain and 2.2 tonnes of calf meal is bought.	Supplements made include 106 tonnes of maize silage and 25 tonnes of pasture silage. 85 tonnes of maize silage, 190 tonnes of Palm Kernel Expeller and 2.7 tonnes of calf meal is bought in.	Supplements made include 9ha (108 tonnes) kale, 8ha (56 tonnes) bulb turnips and 20 tonnes pasture silage. 215 tonnes of palm kernel expeller, 230 tonnes of pasture silage, 75 hay bales and 5.1 tonnes of calf meal is bought.	Supplements made include 13 ha (130 tonnes) bulb turnips and 6ha (160 tonnes) maize silage. 33 tonnes of Palm Kernel Expeller and 3 tonnes of calf meal is bought.	Supplements made include 164 tonnes of maize silage, 14ha (119 tonnes) bulb turnips, 1ha (18 tonnes) fodder beet and 50 tonnes of pasture silage. 220 tonnes of Palm Kernel Expeller is bought.	Supplements made include 60 tonnes of pasture silage and 150 bales of baleage. 140 tonnes of Palm Kernel Expeller and 25 bales of baleage are bought.	Supplements made include 88 tonnes of pasture silage. 321 tonnes of Palm Kernel Expeller is bought.
Economic Farm Surplus	\$991,267 or \$4,254/ha	\$334,024 or \$3,122/ha	\$383,640 or \$2,929/ha	\$758,268 or \$3,717/ha	\$103,477 or \$676/ha	\$546,367 or \$3,214/ha	\$498,932 or \$2,132/ha	\$338,135 or \$1,544/ha

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