ICCC Rural Workshop

February 2019

Interim Climate Change Committee

Introduction

Interim Climate Change Committee

Who are we?

- We are an INDEPENDENT Ministerial Advisory Committee
- We were established in May 2018 as a precursor to the proposed Climate Change Commission
- Asked to report back to Government end of April 2019 on two specific climate change questions – one on electricity and one on agriculture

What we've been asked to do

- Our Terms of Reference ask us to:

  Deliver evidence and analysis on how surrender obligations could best be arranged if agricultural greenhouse gases enter the NZ ETS.

- We've taken a broader view:

  What will get us started on the path to sustained emissions reductions in the agriculture sector over the long term?

What we are discussing today

1. Why reduce emissions from agriculture?
2. What principles should guide policy development?
3. What will drive change?
4. How to protect from the full costs?
5. How to support farmers to reduce emissions?

Why reduce emissions from agriculture?

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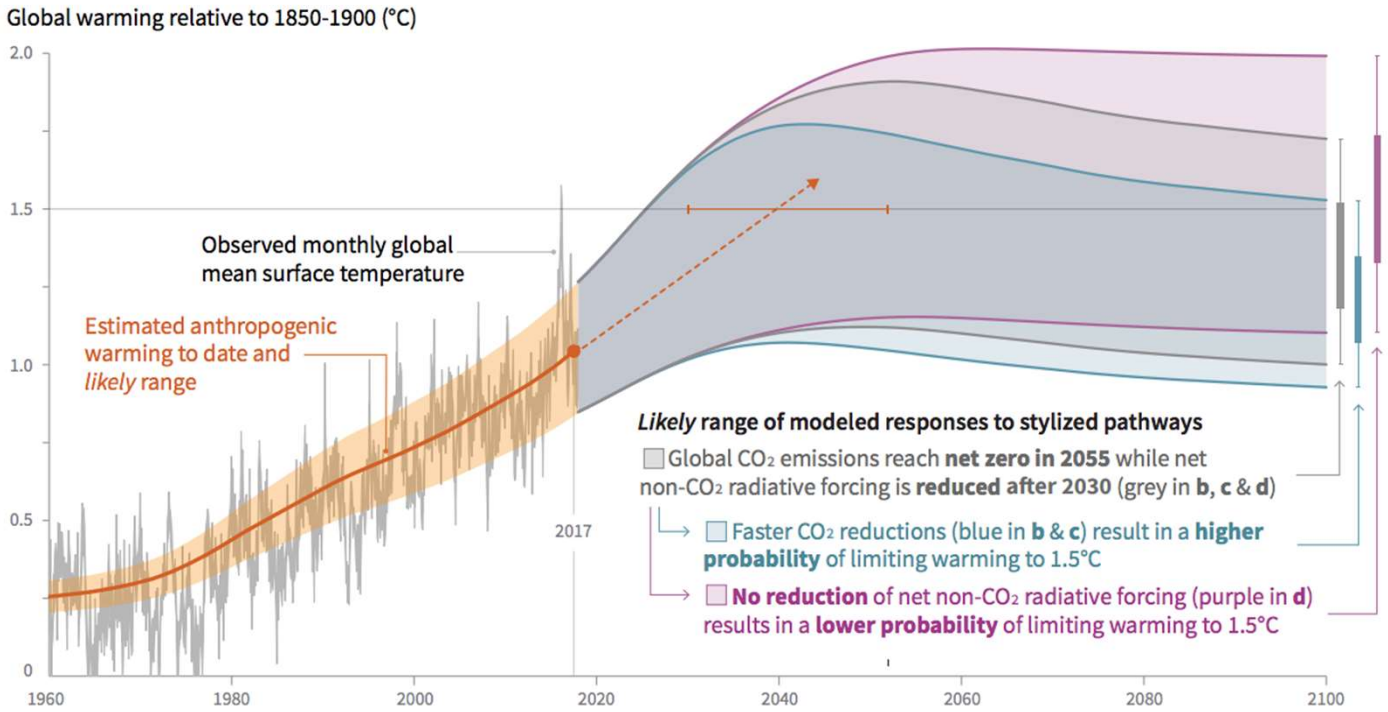
Not ICCC policy – slides for discussion only

Global temperatures are rising



Source: IPCC

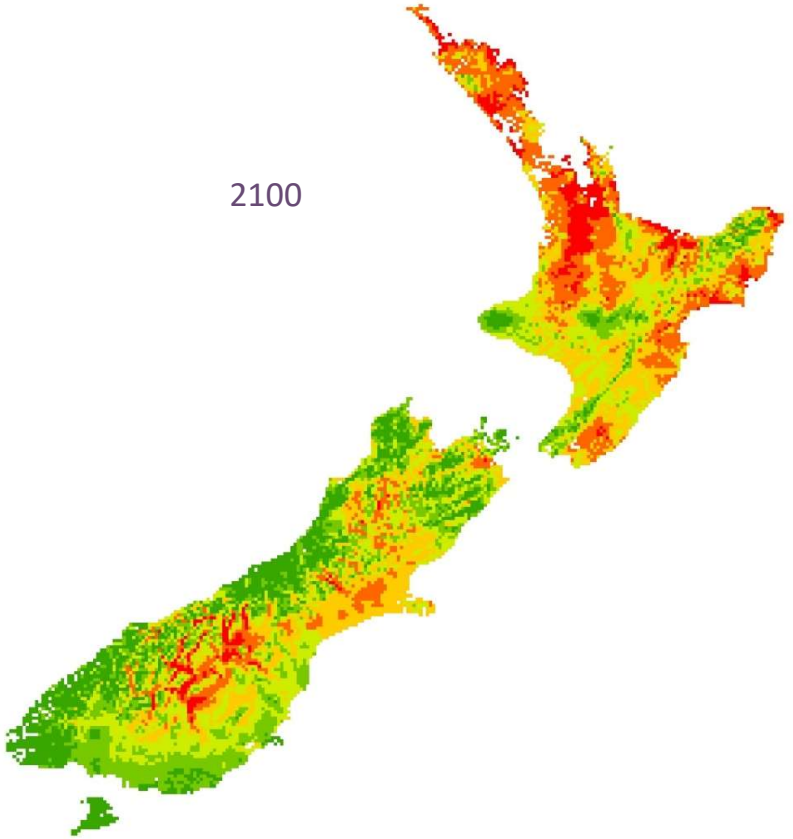
Not ICCC policy – slides for discussion only

Climate change matters for New Zealand

2100

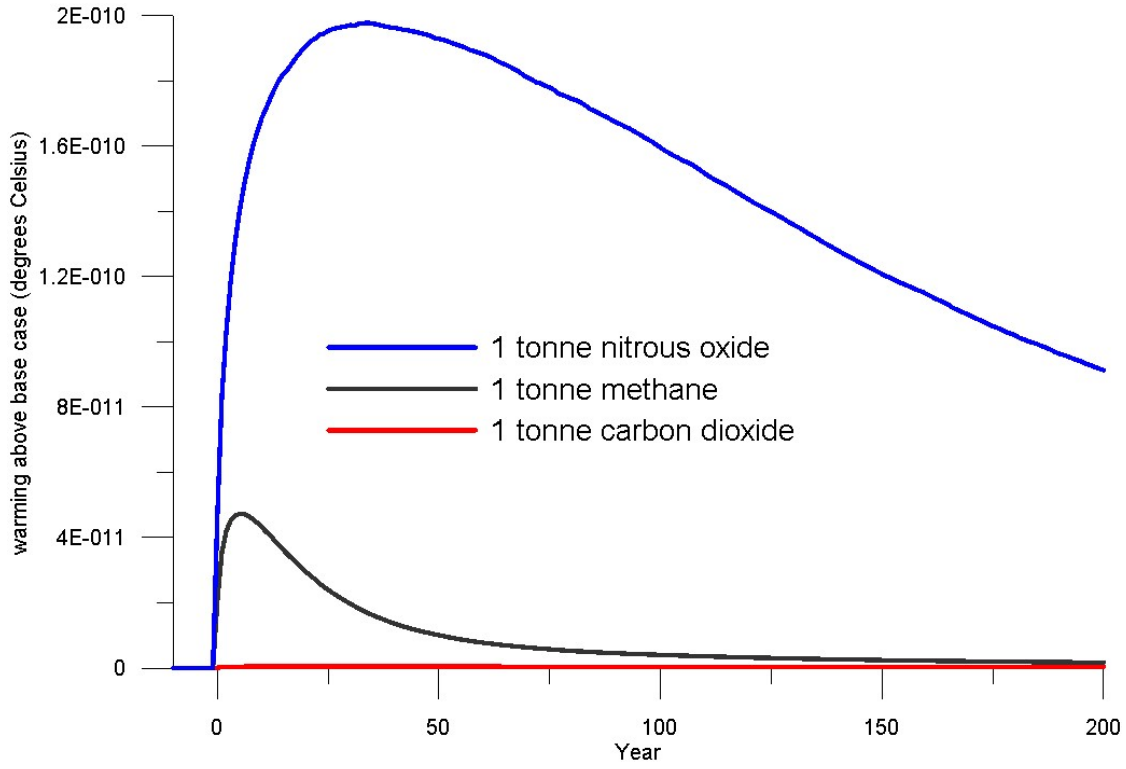
Number of days exceeding 25°C

- >100
- 80–100
- 60–80
- 40–60
- 20–40
- <20

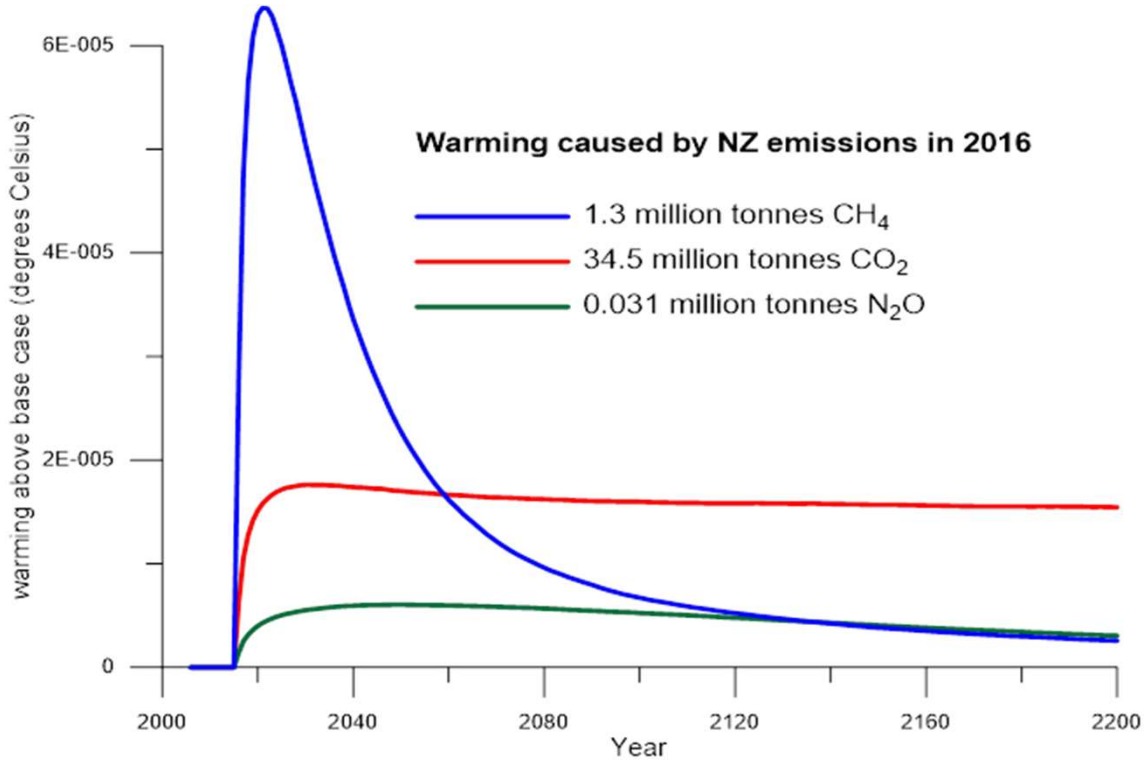


Source: Royal Society of NZ, 2016

Not all gases are created equal



Warming caused by New Zealand emissions

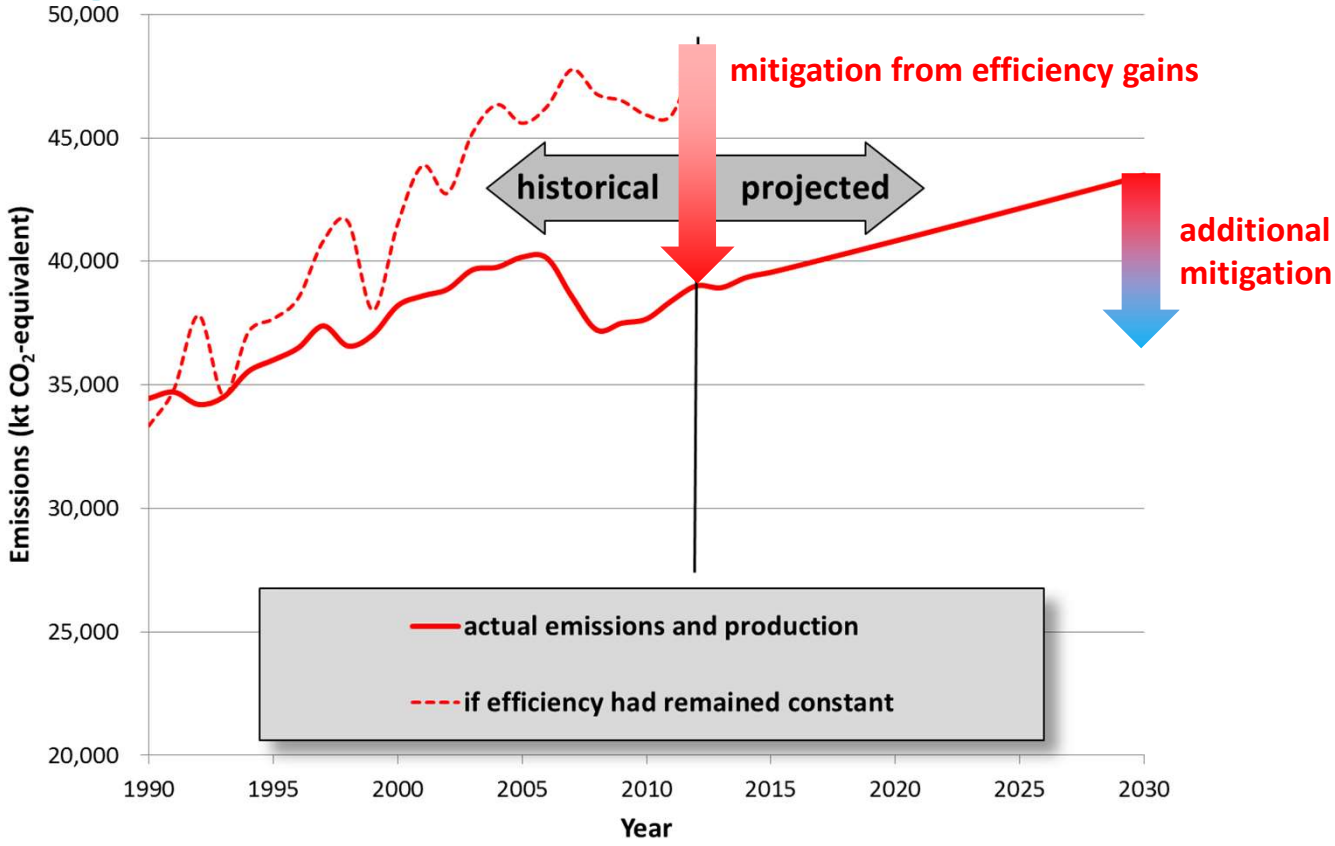


Not all gases are created equal

- All greenhouse gas emissions cause warming
- Globally, carbon dioxide emissions must at a minimum go to net zero
- Nitrous oxide is a very potent long-lived gas that behaves in a similar manner to carbon dioxide
  - It accumulates in the atmosphere
  - Emissions need to get to zero or be offset to avoid further warming
- Methane is a very potent short lived gas.
  - It doesn't accumulate but does cause warming that extends beyond its lifetime
  - Methane emissions don't need to get to zero to avoid further warming

    BUT
  - Reductions in methane will help slow climate change and are critical for keeping warming to well below 2 degrees.

New Zealand Agricultural emissions – efficiency vs absolute



What can you do to reduce agricultural emissions now?

There are five broad areas of action farmers can take right now:

1. Increasing individual animal performance
2. Using different feed types
3. Shifting to a less intensive system
4. Improving the efficiency of fertilizer use/use nitrification/urease inhibitors
5. Diversifying farm operations with alternative lower emission land uses (e.g. cropping, horticulture, trees)

These options are being pursued by farmers already. The challenge is to accelerate uptake.

What can you do to reduce agricultural emissions in the future?

- Low methane breeding
- Methane inhibitor
- New nitrification/urease inhibitors

- Further down the track… Methane vaccine?

- As the focus on emissions increases – it will drive even greater investment in solutions

Questions?

Principles for a policy package

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Key principles for a policy package

We want to design policy that drives reductions in agricultural emissions in a way that is:

- Cost effective
- Appropriately rewards positive actions
- Is practical to implement and easy to understand
- Promotes resilience and manages competitiveness risks
- Helps people and communities cope with change
- Consistent with wider environmental objectives

No single policy will meet all objectives equally

Overarching principle - Demonstrate partnership and good faith with Iwi/Māori

What other principles would you add?

What principles on that list are really important to you?

What will drive change?

Livestock emissions – comparing options

The following three options illustrate a spectrum of choices to drive livestock emissions reductions at the farm level:

Option 1 Mandatory GHG Good Management Practices + Farm Environment Plans

Option 2 GHG emission limit + Farm Environment Plans

Option 3 GHG emission levy and rebate scheme + Farm Environment Plans

We'll describe each option and our analysis of the key pros and cons

We want your feedback on our analysis

Calculating livestock emissions

- To manage their emissions farmers need to be able to calculate them
- There is a range of calculation methods, with a trade-off between cost and complexity

Simple and low cost, but highly averaged

Recognises productivity differences between farms

Complex and higher cost, but more farm specific

Product method:

tonnes product (meat, milk solids) x emission factor

Stock method:

Stock numbers x emission factor

Simple specific methods:

Using 2+ data points, e.g. combining stock numbers with other characteristics (e.g. age) and/or product data.

Complex specific methods:

Tools using multiple farm-specific data points, e.g. Overseer. Farmers may require certified advisers to assist with calculations.

- Government and sector could work together to develop/agree methods or tools

Option 1
Mandatory good management practices

- Every farmer has a Farm Environment Plan based on sector-agreed Good Management Practices for greenhouse gas management

Farmer incorporates GHG GMPs in their Farm Environment Plan → **Farmer implements GMPs as per their Farm Environment Plan** → **Compliance with Farm Environment Plan & GMP verified by 3rd party**

- Good Management Practice for GHGs still to be developed – there are some challenges

Option 1
Mandatory good management practice

Pros

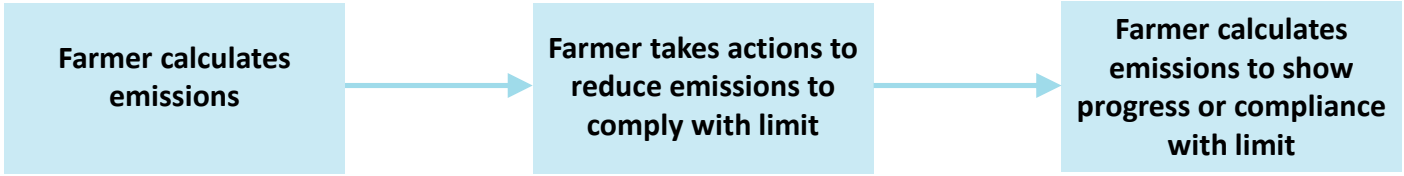
- A familiar approach for some farmers and likely to spread across the country
- Supports integrated farmer decision-making across emissions and other issues
- Some future mitigation options (e.g. methane vaccine) could be well-suited to this approach

Cons

- No confidence that required emissions reductions will be achieved
- GMPs can be interpreted across wide scale of ambition
- Does not embed GHG emissions into thinking about farm system optimisation

Option 2
GHG emissions limit (using FEP)

- Every farmer must comply with a GHG limit applied to their farm
- There are a number of ways limits could be set
  - e.g. a limit on emissions per hectare or % reduction from farm benchmark



- Key differences to water quality
  - the location of the emission doesn't change the outcome for the environment
  - not a single National GHG target but progressive targets over time

Option 2
GHG emissions limit (using FEP)

Pros

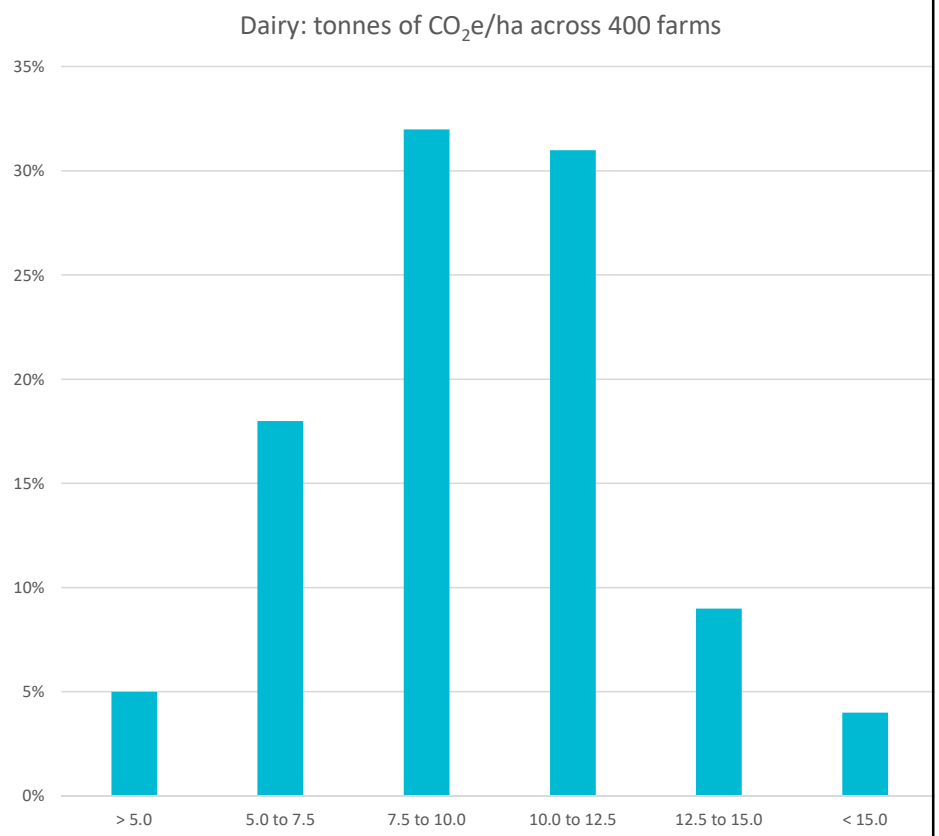
- National GHG target/s can be directly linked to farm-specific limits
- If methane treated differently in national target/s, can set different GHG limits for methane vs nitrous oxide
- Supports innovation - farmers chose what actions they take in order to meet their limits
- FEPs support integrated farmer decision-making across emissions and other issues

Cons

- Due to farms' significant diversity, the cost of reducing emissions will vary widely across farms
- Some farmers will bear high costs, while others could do more cost-effectively than their limit drives them to do
- Results in higher costs to sector and the country overall
- Limits based on historic emissions would penalise underdeveloped land

Every farm is different

There is a wide distribution in farms by emissions per hectare or emissions per product



Source: DairyNZ Economics Group

Every farm is different

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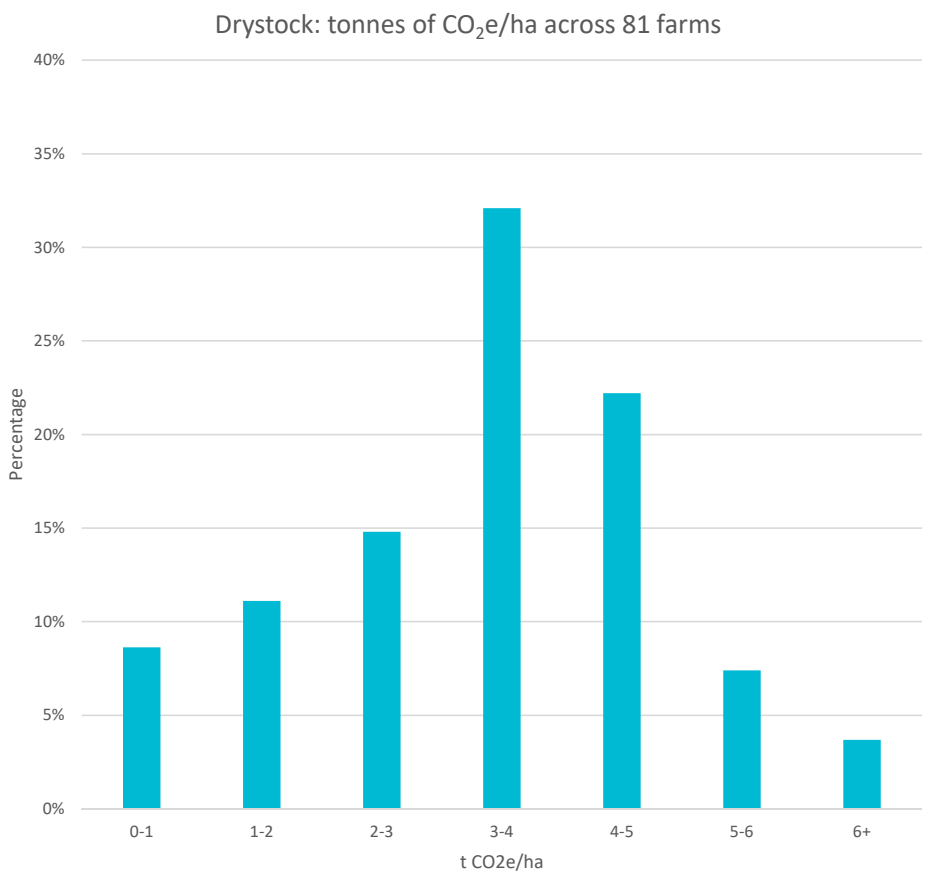

Source: MPI

Every farm is different

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Farm 1: Intensive sheep & beef (King Country)

Stock units	3,016	SU
Stocking rate	10.4	SU/ha
Total emissions	1,174	tonnes CO_2e
Emissions/ha	4.0	tonnes CO_2e
Cost to reduce by 10%	$9,466	
(reduction in EBIT)	10.5%	

Cost of reducing emissions Farm 1 ≈ $80/tonne

Farm 2: Extensive sheep & beef (East Coast)

Stock units	4,130	SU
Stocking rate	8.1	SU/ha
Total emissions	2,375	tonnes CO_2e
Emissions/ha	4.65	tonnes CO_2e
Cost to reduce by 10%	$5,263	
(reduction in EBIT)	15.8%	

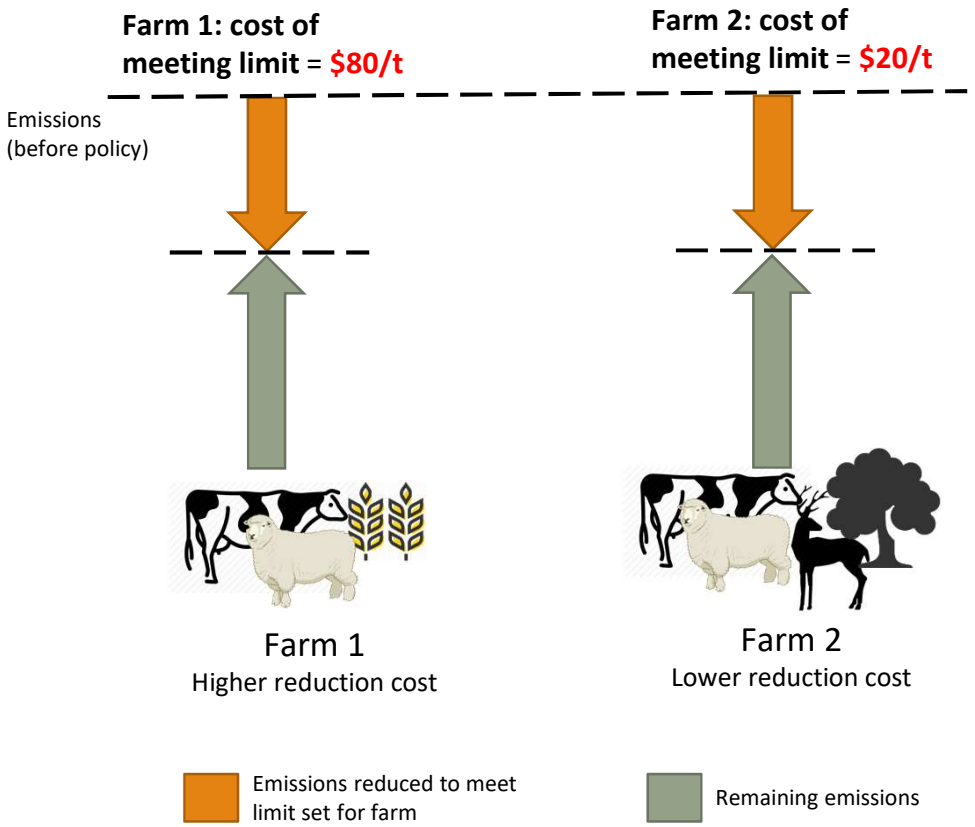
Cost of reducing emissions costs Farm 2 ≈ $20/tonne

Cost effectiveness – Limit

Farms bear different costs to meet same limit

Farm 2 could reduce more at low cost but has no incentive to do so

The more farm specific the target the more cost effective – but no practical way to set cost effective limits for individual farmers



Option 2
GHG emissions limit (using FEP)

Pros

- National GHG target/s can be directly linked to farm-specific limits
- Supports innovation - farmers chose what actions they take in order to meet their limits
- FEPs support integrated farmer decision-making across emissions and other issues
- If methane treated differently in national target/s, can set different GHG limits for methane vs nitrous oxide

Cons

- Due to farms' significant diversity, the cost of reducing emissions will vary widely across farms
- Some farmers will bear high costs, while others could do more cost-effectively than their limit drives them to do
- Results in higher costs to sector and the country overall
- Limits based on historic emissions would penalise underdeveloped land

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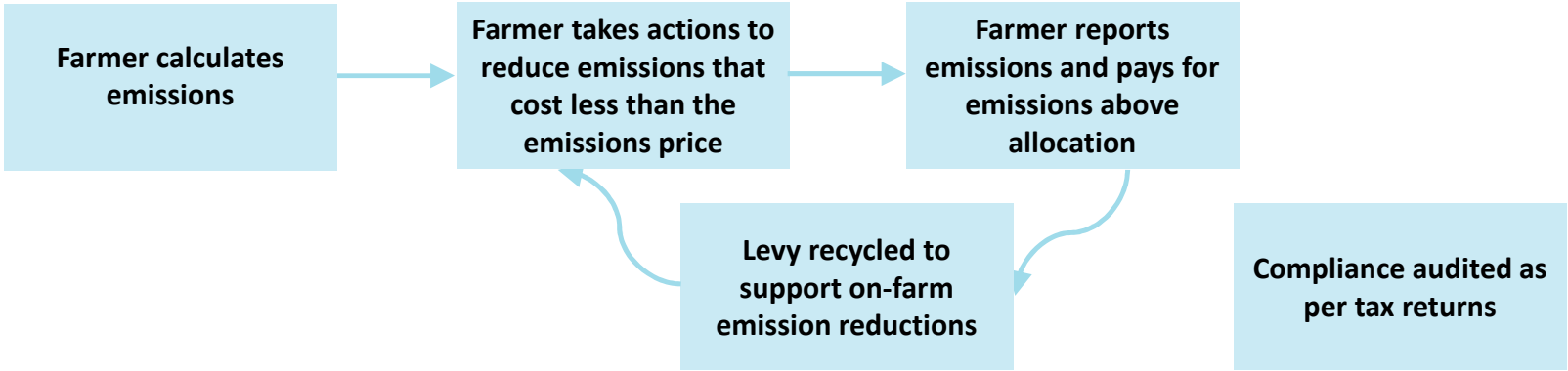
Option 3
GHG emissions levy and rebate (using FEP)

- Every farm's emissions are subject to the levy price
- Farmers pay the levy on any emissions above allocation (or carbon removals) with revenue recycled into an agricultural emissions fund
- The lower the farm's emissions, the lower the levy amount due – and if the emissions are below the allocation, a rebate is received



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Option 3
GHG emissions levy and rebate (using FEP)

Pros

- National target/s can directly link to levy rate
- If methane treated differently in national target/s, can set different levy rate for methane
- Supports innovation - farmers choose what actions they take in response to the price
- FEPs support integrated farmer decision-making across emissions and other issues
- Cost effective - farmers reduce as far as it makes financial sense, given the emissions price

Cons

- Some farmers may prefer a clear externally imposed farm-specific target or goal
- Some negative perceptions associated with levies/ taxes, and concern about how levy rate may change over time.

Cost effectiveness – limit vs levy & rebate

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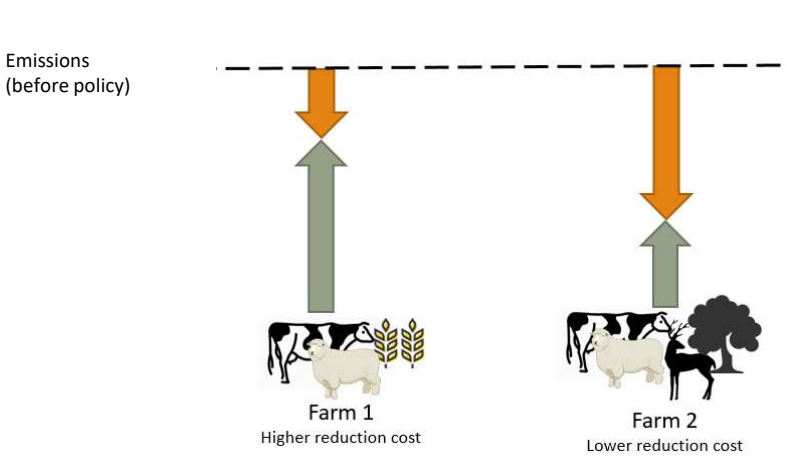
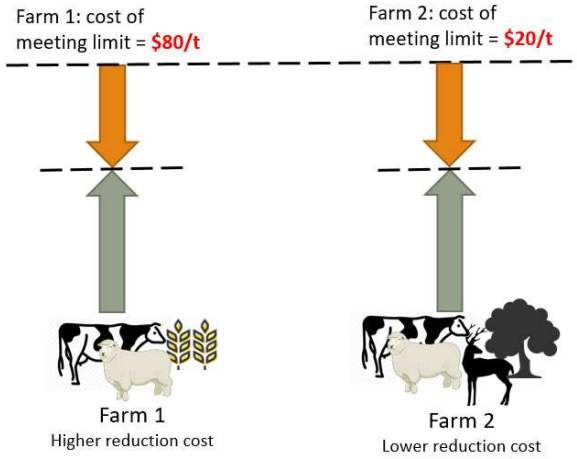




With levy, farms will bear a uniform cost for the reductions they make (for example, $25/t)

With limits, farms will bear a wide range of different costs for their reductions (in this example, $80/t versus $20/t)

Where do you agree/disagree with our analysis?

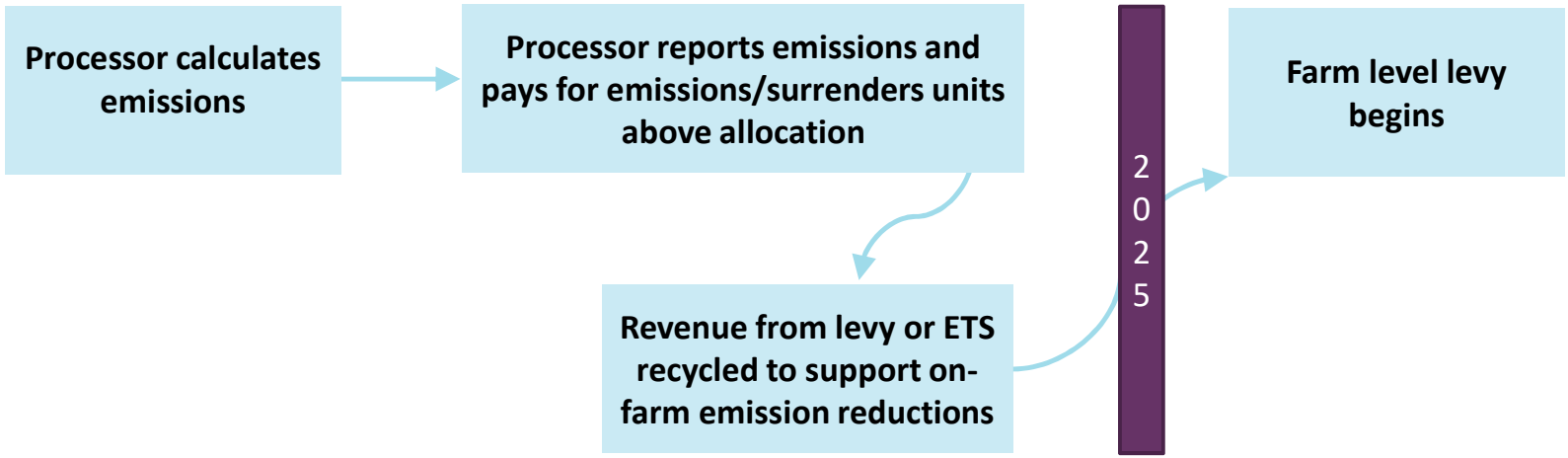
What's missing?

Interim option

- Option 1-3 can not be implemented in the short term
  - it would take at least three, but more likely five years to build capability and roll out any farm-level emissions policy
- An interim measure could be implemented via processors
- An interim measure is needed to:
  - give certainty to farmers, processors and sector bodies
  - respond to calls that agriculture contributes to meeting targets
  - ensure farm level policy gets underway

Interim option – processor level ETS/levy

- Develop a joint government-sector action plan with concrete actions and dates by which key steps must be taken to get farm level levy up and running
- Implement an emissions levy or ETS at agricultural processor level



Interim option – processor level ETS or levy

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Pros

- Can start in 2020 - ensures the agriculture sector starts to play a part before 2025
- Weak price signal ensures gradual start
- Gives certainty to farmers that emissions will be priced in the short and long term
- Provides impetus for the sector to get farm level policy up and running
- Generates funds that can be used to assist getting a farm level policy underway
- Can help build awareness by noting levy or ETS cost on kill sheets, monthly milk receipts

Cons

- Concern about inertia leading to policy lock-in
- Could be confusing, given that farm level policy is ultimate aim
- Treats all farmers the same – does not differentiate or reward early adopters

Where do you agree/disagree with our analysis?

What are alternative measures that could still give policy certainty and ensure the agriculture sector plays its part before 2025?

Protection from full costs

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Protection from full costs

- Any policy to reduce emissions will involve costs – but there are ways to assist farmers and/or the sector with these costs
- Free allocation is one way to provide assistance with costs
- Free allocation is an emissions allowance provided to participants in any emissions pricing scheme, so they don't have to pay for all of their emissions

What is free allocation?

- For a levy and rebate scheme with free allocation, to work out the net levy obligation each year a farmer would:
  1. Calculate the farm's annual emissions (A)
  2. Work out the annual free allocation (B), using the applicable method
  3. The net obligation = A minus B multiplied by the levy rate.
     - If A is larger than B, a levy payment must be made
     - If A is smaller than B, a rebate will be due

Protection from full costs

- The Government has committed that if agriculture is to be included in the ETS, then:

  *"upon entry, the free allocation to agriculture will be 95%, but with all revenues from this source recycled back into agriculture in order to encourage agricultural innovation, mitigation and additional planting of forestry."**

- There are different ways to provide free allocation - but what is appropriate depends on what objectives are most important.

* New Zealand Labour Party and New Zealand First coalition agreement

Possible reasons for assistance

Potential objectives for free allocation could be:

- **Managing social impacts from land use change to forests** – changing employment opportunities may have flow-on effects for rural communities (e.g. school closures).
- **Maintaining farmers' ability to service debt** – as reduced cash flow may affect some farmers' ability to service their high debt levels.
- **Assistance with stranded farm assets** – some land may become less profitable for farming and decline in value, leading to loss of equity or stranded dairy platform investments.
- **Assistance with stranded processing assets** – de-intensification may shorten the life of both dairy and meat processing plants, in particular regions.
- **Minimise risks to international competitiveness** – to ensure that our policies contribute to global emissions reductions, not shifting production to increase emissions elsewhere.

No one method of free allocation can do all of these things equally well

What does 95% free allocation look like?

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- Cost exposure to the sector overall would be 5%
- At a $25 emissions price, annual cost to sector would be around $50 million per annum rather than almost $1 billion without free allocation
- On average, emissions costs would be as below

Average cost, $25 emissions price, with 95% free allocation*	
Per dairy cow	$4.60
Per sheep	$0.43
Per tonne of urea	$2.92

Average cost, $25 emissions price with 95% free allocation*	
Per kilogram milk solids	$0.01
Per kilogram sheep meat	$0.03
Per kilogram beef	$0.01

- BUT how free allocation is provided can significantly alter how these costs are distributed across individual businesses…

*based on the 2016 national GHG inventory emissions for agriculture

Free allocation methods - options

- **Grandparenting:** free allocation quantity would be determined by historic data specific to each farm, such as historic emissions, animal numbers, or production.
- **Land-based:** free allocation would be provided on a per hectare basis, with either a flat rate per hectare for a particular land use, or some other proxy around land (e.g. LUC).
- **Proportional:** the free allocation quantity is a percentage of the farm's annual reported emissions.
- **Output-based:** a farm's annual product output (milk, stock) would determine its free allocation. If there are two or more activities (e.g. dairy + beef) on a farm, an allocation would be given for each activity.

Note: free allocation does not set an individual goal or target for the recipients, it is simply a mechanism to assist with costs.

Protection from full costs: analysis

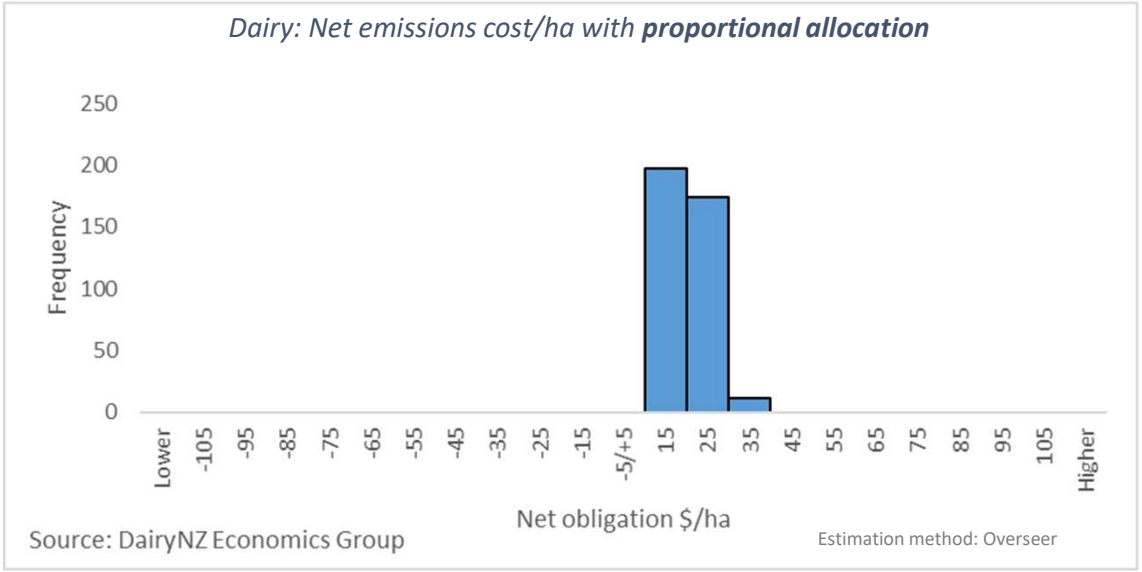
- We're working with DairyNZ, B+LNZ and MPI data to analyse how different free allocation approaches might impact farms
- The following slides contain some interim results showing how different methods affect costs
- In each graph, the total costs across the sample are the same
- But who is advantaged or disadvantaged, and by how much, changes

Grandparenting

- We've heard that many in the sector strongly dislike grandparenting:
  - It's seen as rewarding polluters and punishing those who have already reduced emissions
  - It can penalise those who have not intensified their land and is likely to disproportionately disadvantage Māori land holdings
- Implementing grandparenting would also be practically challenging
- We have not modelled the impacts of grandparenting due to the above reasons as well as data limitations

Proportional allocation - Dairy

- Proportional allocation provides little differentiation – all farmers face similar net costs, irrespective of how 'well' they perform
- No farmers get a 'net benefit' – all have to pay something for their emissions



Proportional allocation - Drystock

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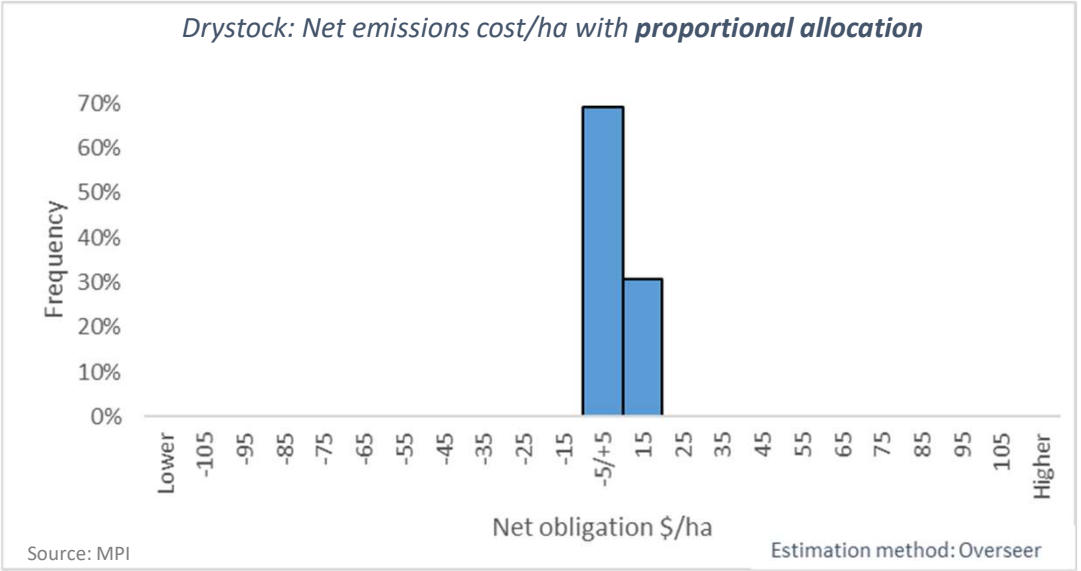
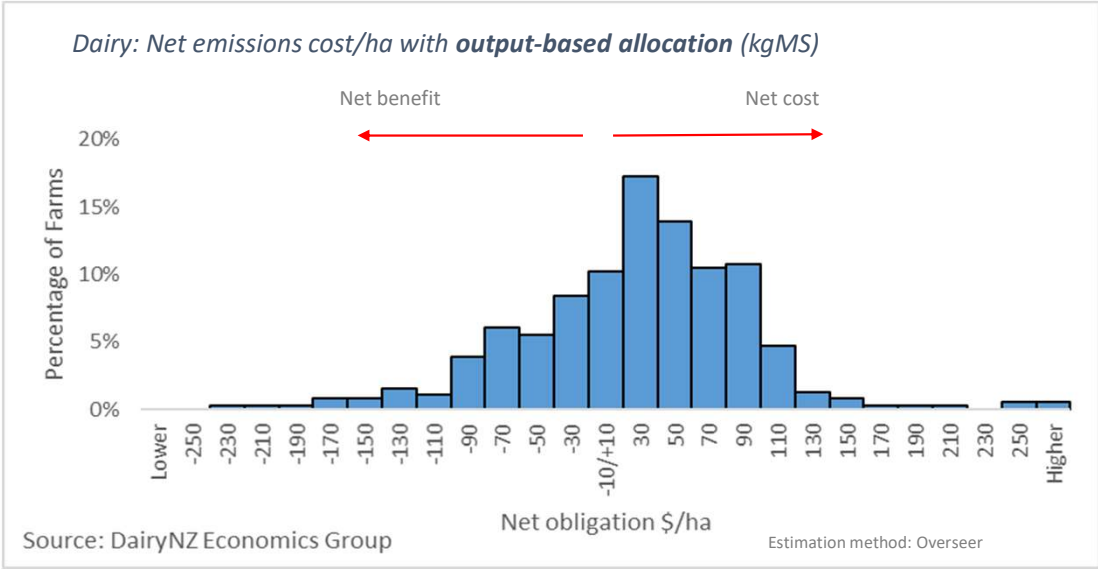


Output-based allocation - Dairy

- Rewards emissions efficiency – farmers with below average emissions/kgMS benefit, and the 'better' they are, the more the reward.
- Gives some farmers a net benefit rather than net cost
- Best approach for protecting international competitiveness, as it weakens the incentive to reduce emissions by reducing output



Output-based allocation - Drystock

- Rewards emissions efficiency – farmers with below average emissions/head benefit, and the 'better' they are, the more reward.
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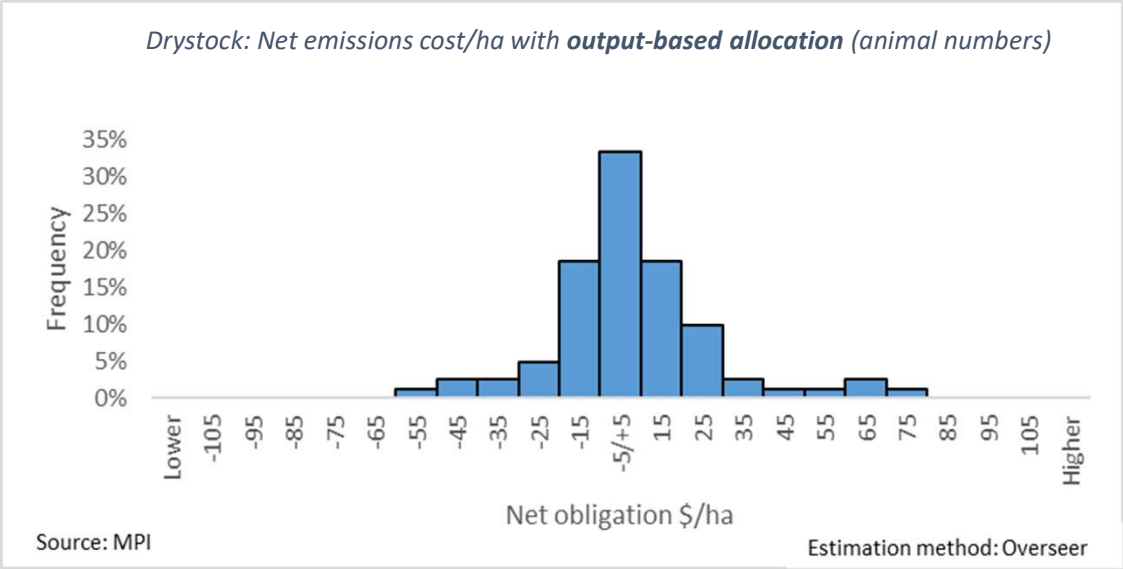
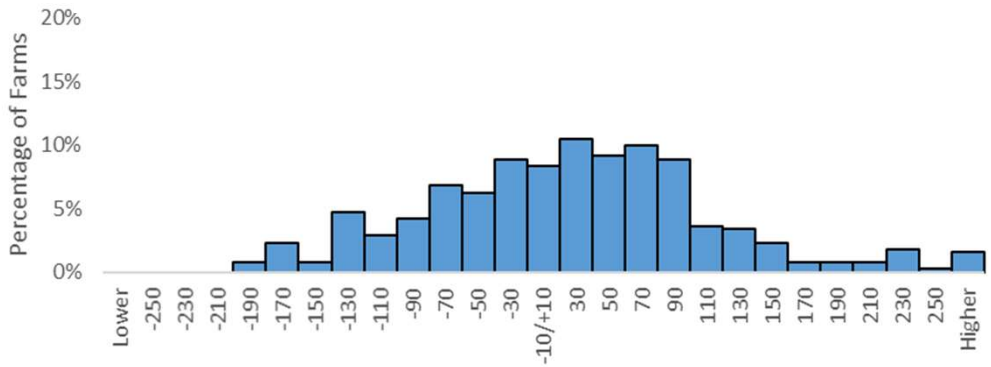


Land-based allocation - Dairy

- Rewards emissions efficiency and de-intensification or land use change – the lower a farm's emissions/kgMS and emissions/hectare, the better off it is.
- But it is likely that intensive farms, even if very efficient, will be disadvantaged.
- Gives some farmers net benefit rather than net cost.
- Encourages improved efficiency but also reductions through reducing output – not the best method for protecting international competitiveness or the wider community /sector

*Dairy: Net emissions cost/ha with **land-based allocation** (flat rate/ha)*



Source: DairyNZ Economics Group

Estimation method: Overseer

Land-based allocation - Drystock

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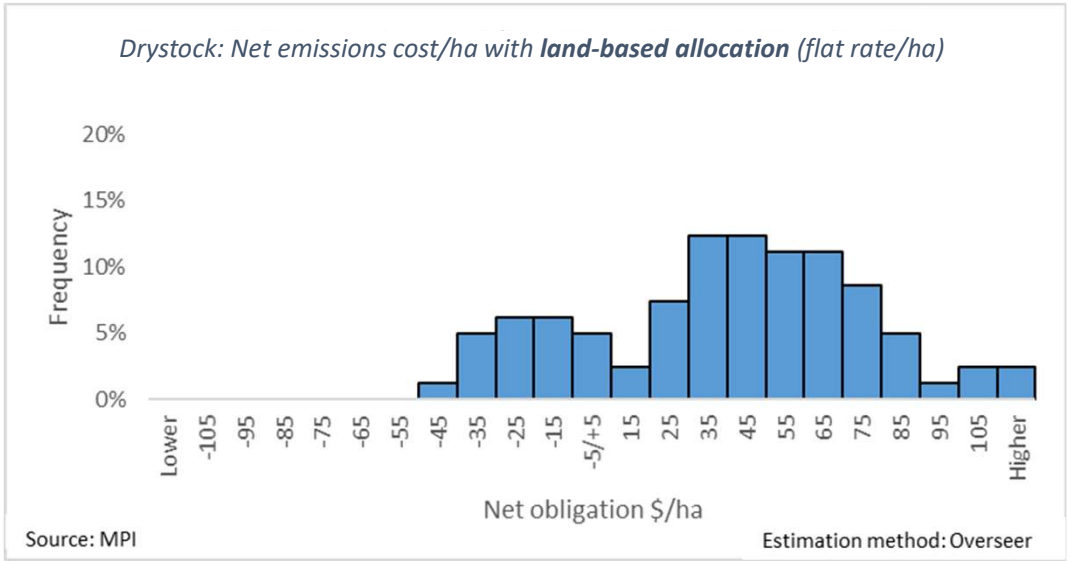

Free allocation methods – summary

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Method	Pros	Cons
Grandparenting	• Assists with stranded farm assets • Preserves marginal price incentives - rewards both reducing output and improving emissions intensity	• Seen as rewarding polluters and disadvantaging lower emission farms • Will drive reductions in output, so does not assist with wider sector / social impacts
Proportional	• Very simple to understand • Treats farmers similarly	• Strongly weakens marginal price incentives • Does not differentiate farmers
Output-based	• Best for protecting international competitiveness • Assists with wider sector and social impacts (stranded processing assets and community impacts)	• Weakens incentive to reduce absolute emissions (strongly rewards emissions intensity improvements)
Land-based	• Preserves marginal price incentives - rewards both reducing output and improving emissions intensity • Benefits lower emission farms or those who have taken early action to reduce emissions	• If based on Land Use Capability, could be complex to understand and implement • Will drive reductions in output, so does not assist with wider sector / social impacts

Different methods of allocation affect farmers differently – what pro or con is most important to you? Why?

Should the method of free allocation be the same for the dairy and drystock sector? Why/Why not?

How to support farmers to reduce emissions?

FARM ENVIRONMENT PLANS AND EXTENSION

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Farm Environment Plans are a critical tool

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- Emissions management needs to be part of broader farm management
- Agriculture sector groups have targets for delivery of Farm Environment Plans to their farmers and growers
- Opportunity to build on existing tools and avoid duplication
- **Work is needed to develop a climate change module or menu of practices for incorporation into Farm Environment Plans**

Extension and training are also critical

- There are capacity and capability gaps for good advice on agriculture greenhouse gas mitigation
- There are existing extension programmes that work well and farmers trust
  - e.g. Catchment groups, RMPP action networks

- **Advice on agriculture greenhouse gas mitigation needs to be built into the programmes farmers already know and trust**

What is needed to get Farm Environment Planning and extension ready to enable farmers to reduce emissions?

What else is needed in the tool box to support farmers to reduce emissions?

Wrap up and next steps

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What else are we working on?

- Counting carbon dioxide taken up by trees on farm/netting off
- Understanding impacts on rural communities
- Understanding impacts on Iwi/Māori
- Opening up opportunities

Bringing today together

- Key principles for a policy package
- What will drive change?
- Protecting from full costs
- How to support farmers to reduce emissions?

What's still to come

- Rural Workshops
  - Waikato (20 Feb)
  - Northland (22 Feb)
  - Palmerston North (25 Feb)
  - Invercargill (27 Feb)
  - Christchurch (28 Feb)

- Final report to government on 30 April

Got some more feedback?

Please email us at feedback@iccc.mfe.govt.nz