

Technical Appendix 1: Decision on a preferred option

The Partnership used a number of analytical tools to assess the pricing system options and support decision making on a preferred option. This included Sectoral impacts modelling and cost-benefit analysis, consultation feedback from farmers, and a multi-criteria analysis. This technical appendix contains the Partnership criteria and multi-criteria analysis (MCA).

He Waka Eke Noa criteria and sub criteria

Criteria	Sub criteria
Effective	1(a) Achieves behaviour change and emissions reductions
	1(b) Incentivises uptake of cost-effective mitigation
	1(c) Avoids emissions leakage, allows food production to be maintained, and supports global emissions reduction
	1(d) Supports a split-gas approach to biogenic methane
	1(e) Increases carbon sequestered
	1(f) Avoids carbon losses from sequestration options
	1(g) Incentivises uptake of cost-effective on-farm sequestration options
Practical	2(a) Minimises administration for the regulator and implementing organisations
	2(b) Minimises administration and compliance costs to participants e.g. is practical and efficient for participants to interact with
	2(c) Is verifiable, auditable, and enforceable
	2(d) Allows for different kinds of vegetation to be considered for sequestration
Credible	3(a) Methods are scientifically robust (including mātauranga Māori) and transparent
	3(b) Adaptable to mātauranga Māori and updates as science, technology, and management practice changes
Integrated	4(a) Integrates with and supports broader government and industry initiatives, processes, and tools (e.g. monitoring, modelling, reporting) to reduce greenhouse gas emissions
	4(b) Supports a productive, profitable, and competitive New Zealand agricultural sector
	4(c) Supports wider government and sector objectives, such as freshwater health, biodiversity, animal welfare, and soil health
	4(d) Is consistent with the Crown's Treaty of Waitangi obligations.
Equitable	5(a) Gives affected parties an appropriate amount of time to modify practices and transition to the new system
	5(b) Rewards past actions undertaken by early adopters and does not penalise people for not having developed their land
	5(c) Distributional impacts are equitable, including Māori agribusiness
	5(d) Recognises the wellbeing of rural communities and our people

Multi-criteria analysis

A multi-criteria analysis (MCA) is an important tool used to evaluate different policy options to improve decision-making. An MCA complements a cost-benefit analysis (CBA) and evaluates different options against a set of criteria.

Applying an MCA involves identifying the underlying policy objectives and then determining factors (the criteria) that would indicate achievement of the objectives. The MCA uses the agreed He Waka Eke Noa criteria and sub-criteria with a traffic light scoring system. Applying an MCA also involves clear identification of a 'counterfactual' or a base case. The counterfactual is intended to capture policy settings in absence of the options being considered. This does not necessarily mean business as usual but, instead, what would happen without the policy intervention being considered. For He Waka Eke Noa this is the primary sector entering the New Zealand Emissions Trading Scheme (NZ ETS) under current policy settings. All policy proposals are assessed against agriculture entering the NZ ETS (the counterfactual), not each other i.e., it is the degree to which they are different to the base case that matters in the analysis.

The MCA also reflects an NZ ETS + He Waka Eke Noa recommendations option (NZ ETS + HWEN recs) (e.g., the use of system revenue to support emission reduction initiatives and some He Waka Eke Noa eligible sequestration) as a separate option. While government has not formally tabled this option, it is a relevant option based on existing government decisions e.g., recycling revenue from agriculture to support the primary sector.

Key results

The key differences between the options and the NZ ETS (the counterfactual) are:

Whether the option allows a split-gas approach. All alternative pricing options are built on this basis. The NZ ETS and NZ ETS + HWEN recs options are not. A split-gas approach allows a deviation between prices on methane and long-lived gases, which you do not get in an all-gases market-based approach like the NZ ETS. The benefits of a split-gas approach are likely to be more consequential post-2030, assuming the methane target is met and there is upward price pressure on the NZU to meet the 2050 net zero target. A levy-based system as opposed to a market-based system provides greater control over the prices on methane and long-lived gases. Prices can be dialled up or down depending on progress toward objectives of the system. All alternative pricing options are built on this basis. A levy-based system can also be accompanied by a system oversight mechanism to provide the sector with greater control over how the levy rates would be set, and a more formal role for the sector in setting the strategy for revenue recycling.

Emissions reductions (relative to the NZ ETS). All options are better than the NZ ETS. It is assumed for the MCA that all alternative options and the NZ ETS + HWEN recs option will achieve similar contributions to the methane target and the long-lived gas target through additional incentives (discounts) for actions (practices and technologies) to reduce emissions.

Behaviour change. All options are better than the NZ ETS. The farm-level levy and the processor-level hybrid levy transitioning to farm-level levy are assessed as being more able to support farmer behaviour change. The Momentum behaviour change report¹ finds: "Provided mitigations are available, a farm-level option is likely to be more effective for encouraging on-farm change as it provides a direct link to their operation and allows for the diversity of farm operations and land use, which a Processor-level Levy may be less likely to do."

Incentivising uptake of cost-effective mitigation. All options are better than the NZ ETS. Under a farm-level levy the simple and detailed calculation method can reward all possible mitigations, including efficiencies/optimisation with incentives for actions (practices and technologies) to reduce emissions. Under a Processor-level Hybrid Levy it

¹ Momentum Research and Evaluation Ltd, 2022, Insights into farmer behaviour responses to emissions pricing.

would depend on the approach taken. A benchmark approach could incentivise uptake of all available mitigations and an action-based approach would only incentivise some.

Emissions leakage.² The greater the impact on production the greater the risk of emissions leakage. A Farm-level Levy and a Processor-level Hybrid Levy with an action-based Emissions Management Contract (EMC) rely on payments for mitigation technologies to enhance the incentive to reduce emissions. This results in a much smaller impact on production (and therefore risk of leakage). A Processor-level Hybrid Levy with benchmark EMC enhances the benefit of all available mitigations, but this comes with a greater impact on production.

Increasing carbon sequestration. All alternative options are better than the NZ ETS. We have assumed that the NZ ETS + HWEN recs option does not adopt all the He Waka Eke Noa sequestration related recommendations.

Administration costs for the regulator. All alternative options and the NZ ETS + HWEN recs option are more expensive than the NZ ETS. The Farm-level Levy and Processor-level Hybrid Levy transitioning to Farm-level Levy are the most expensive options.

Administration and compliance costs to participants. This is similar to administration costs for the regulator but with an assumption that the cost to processors is likely to be lower under a levy relative to the NZ ETS. The NZ ETS + HWEN recs option scores the same as Processor-level Hybrid Levy because of the assumed addition of the EMC system. The Farm-level Levy and Processor-level Hybrid Levy transitioning to Farm-level Levy are the most expensive options.

Time to transition. All options allow for starting with a lower price and changing as needed over time. The NZ ETS can do this through allocation.³ Levy rates can be adjusted up and down. We have assessed the Farm-level Levy as scoring slightly lower than the NZ ETS as there is not a lot of time to onboard around 23,000 participants and build the support that will be required e.g., rural professional capability and a quality and integrated IT system.

² Emissions leakage is when production is shifted to less emissions efficient producers offshore.

³ Allocation is a portion of emissions or emissions units given to an emitter at no cost.

Table 1: Multi-criteria analysis (MCA) for He Waka Eke Noa pricing system options

Criteria	Subcriteria	Measures	Comments	Additional option added for transparency and completeness				
				Main alternative pricing system options				
				NZ ETS + HWEN recs	Processor-level Hybrid Levy		Farm-level Levy	Processor-level Hybrid Levy transition to Farm-level Levy
Traffic light	Benchmark EMC	Action-based EMC	Traffic light	Traffic light	Traffic light			
Effective	1(a): Achieves behaviour change and emissions reductions	Contribution to methane target	All options will achieve credible emissions reductions (around 4% reduction in methane emissions) by 2030 with incentives for actions to reduce emissions. The alternative options achieve this result at different prices and with the use of different prices for incentives for approved actions. The MCA focuses on the ability to contribute to the methane target rather than the specific prices/discounts required.	Green	Green	Green	Green	Green
		Contribution to long-lived gas target	All options will achieve credible contributions to the long-lived gas target by 2030 with incentives for actions to reduce emissions. The alternative options achieve this result at different prices and with the use of different prices for incentives for approved actions. The MCA focuses on the ability to contribute to the long-lived gas target rather than the specific prices/discounts required.	Green	Green	Green	Green	Green
		Supports behaviour change	The Farm-level Levy scores slightly higher. The 'insights into farmer behaviour' report finds "Provided mitigations are available, a farm-level option is likely to be more effective for encouraging on-farm change as it provides a direct link to their operation and allows for the diversity of farm operations and land use, which a processor-level levy may be less likely to do."	Light Green	Light Green	Light Green	Light Green	Light Green
	1(b): Incentivises uptake of cost-effective mitigation	If price/payment is greater than cost of emissions Calculation method picks up mitigation	Under a farm-level system the simple and detailed calculation methods can reward all possible mitigations, including efficiencies and optimisation. Under the Processor-level Hybrid Levy it would depend on the approach taken. A benchmark approach could incentivise uptake of all available mitigations with the incentive enhancing the reward on all available mitigations; an action-based approach would only incentivise some.	Light Green	Light Green	Light Green	Light Green	Light Green
	1(c): Avoids emissions leakage, allows food production to be maintained, and supports global emissions reduction.	Avoids reduction in production	There is a risk of emissions leakage. This is dependent on the ultimate levy price and impact of that price on production. Partnership modelling shows that under the high technology scenarios ⁴ you can achieve emissions reductions without much impact on production. The low technology scenarios rely more on loss of production to achieve emissions reductions. The Processor-level Hybrid Levy using a Benchmark EMC incentivises all available mitigations (especially efficiency gains) and this results in a reduction of production of around 6% to achieve emissions reductions. This is a product of the modelling approach.	Blue	Yellow	Blue	Blue	Blue
	1(d): Supports a split-gas approach to biogenic methane	Whether the option allows a split-gas approach	The alternative pricing options score better relative to NZ ETS. This is a key point of difference to the counterfactual.	Red	Light Green	Light Green	Light Green	Light Green
	1(e): Increases carbon sequestered	Increases He Waka Eke Noa eligible carbon sequestration Additional tonnes sequestered	Creates an incentive for sequestration that is not currently covered under NZ ETS. All options score higher than NZ ETS. NZ ETS + HWEN recs option scores slightly lower as government has not committed to adopting all the He Waka Eke Noa recommendations for sequestration. The assumption is adoption rates are consistent across options. Note, it is possible that the Farm-level Levy could have slightly higher adoption rates as it is part of a netting off process. Not a key point of difference between alternative options.	Yellow	Light Green	Light Green	Light Green	Light Green
	1(f): Avoids carbon losses from sequestration options	Avoided carbon loss	He Waka Eke Noa options recognise existing vegetation (including pre-1990 vegetation) with minimum management standard. Not a key point of difference between alternative options.	Yellow	Light Green	Light Green	Light Green	Light Green
	1(g): Incentivises uptake of cost-effective on-farm sequestration options	Does the method incentivise uptake of cost effective sequestration options Cost-effective refers to the cost of the mitigation rather than cost of the process (which is captured under administration costs).	Price for sequestration will be the same for all options. Process for registration is simpler than NZ ETS as a lower burden of proof is required. Accounting methodology for cyclical and permanent vegetation incentivises sequestration from a wide range of vegetation types. Consistent across options but better than NZ ETS (based on current settings). Not a key point of difference between alternative options.	Light Green	Light Green	Light Green	Light Green	Light Green
Practical	2(a): Minimises administration for the regulator and implementing organisations	Minimises admin costs	This is a key point of difference between options (depending on the approach taken in relation to EMCs). Based on the total admin costs (rather than per participant), the Farm-level Levy is the highest. For Processor-level Hybrid Levy it depends on whether you use a benchmark or action approach. A benchmark approach has regulator operating costs similar to farm-level, and an action approach is cheaper. The Processor-level Hybrid Levy is likely to be higher cost to administrator than the counterfactual as they will need to establish a new levy system.	Blue	Yellow	Blue	Yellow	Red
	2(b): Minimises administration and compliance costs to participants e.g. is practical and efficient for participants to interact with	Minimises admin and compliance costs	This is a key point of difference between options. The Farm-level Levy administration cost is higher. The cost to processors is likely to be lower under a levy system relative to the counterfactual.	Light Green	Light Green	Light Green	Yellow	Red

⁴ The Sectoral impacts modelling used two mitigation technology scenarios: a medium-technology scenario and a high-technology scenario. The high-technology scenario assumes greater availability of technology options, including higher uptake rates and lower costs.

	2(c): Is verifiable, auditable and enforceable	Can put effective and implementable rules and processes around it; Verifiable covers whether participants can be registered and traceable Verifiable relates to revenue not emissions reduction	All options would be designed to do this. It is easier to identify participants and audit at a processor level. There would also be fewer participants engaging with the contract system. These participants would be wanting to do this so there would likely be increased compliance.					
	2(d) Allows for different kinds of vegetation to be considered for sequestration	Original criteria was around participants being able to weigh up costs and benefits of sequestration options	He Waka Eke Noa options recognise a wide range of vegetation. Not a key point of difference between alternative options.					
Credible	3(a): Methods are scientifically robust (incl. Mātauranga Māori)	Based on peer-reviewed science and tools that have been tested in the field and shown to work	All methods used will be robust as they have been designed this way. But some will have a higher degree of accuracy at the farm level e.g. the use of national averages (for the Processor-level Hybrid Levy and EMCs using the action-based method) is less accurate than farm-level reporting.					
	3(b): Adaptable to Mātauranga Māori and updates as science, technology and management practice changes	Option/system is adaptable to updates as science, technology and management practice changes	Consistent across options.					
Integrated	4(a) Integrates with and supports broader government and industry initiatives, processes and tools (e.g. monitoring, modelling, reporting) to reduce greenhouse gas emissions	Connection and integration with others systems/objectives; Verifiable covers whether participants can be registered and traceable	All of the options have the potential to integrate and support broader government and industry initiatives. Not a key point of difference between alternative options relative to the counterfactual.					
	4(b) Supports a productive, profitable, and competitive New Zealand agricultural sector	Profitability and production	Same as 1(c).					
	4(c) Supports wider government and sector objectives, such as freshwater health, biodiversity, animal welfare, and soil health	Supports wider government and sector objectives relating to environment and animal health	Same as 4(a).					
	4(d) Is consistent with the Crown's Treaty of Waitangi obligations.	Participation: acknowledges sovereignty/governance. This means ensuring equal participation at all levels, and also that Māori have input into decision-making that directly affects them. Protection: Acknowledges the protection of rights, benefits and possessions (including tikanga and taonga). Partnership: Acknowledges sovereignty/governance and working together with the same rights and benefits as subjects of the Crown. It means engaging with Māori in the community when you plan work that affects them.	This is an ongoing commitment.					
Equitable	5(a): Gives affected parties an appropriate amount of time to modify practices and transition to the new system	Balances desire for speed with the level of change needed	All options allow for starting with a lower price and changing as needed over time. NZ ETS can do this through allocation. The levy rate can be adjusted up and down. For a processor-level to farm-level transition, this would allow time to scale up to around 20k participants and the support that will be required e.g. rural professional capability. It also allows more time for quality IT system build.					
	5(b): Rewards past actions undertaken by early adopters and does not penalise people for not having developed their land	Reward past action: yes/no; Does not penalise: yes/no	A farm-level system is likely to reward early adopters and does not penalise people for not having developed their land as the lower the emissions the less you pay. A processor-level system that uses a benchmark approach for EMCs possibly works against this. The system would need to actively manage/mitigate these impacts.					
	5(c): Distributional impacts are equitable, including Māori agribusiness	Distributional impacts	Distributional impacts will be influenced by: 1) How emissions efficient per unit of product a farming system is (this varies widely with dairy typically more emissions efficient per unit of product than sheep and beef farming, and a wide variation within sheep and beef e.g. intensive sheep and beef through to deer and extensive high country farming; and 2) Whether a farm can access mitigations and/or sequestration. In terms of the differences between options, distributional impacts only relate to the use of national averages (used for the NZ ETS and Processor-level Hybrid Levy). Those farms that are more efficient than the national average will be disadvantaged by the use of national averages and vice versa. <u>Note:</u> the Processor-level Hybrid Levy will only be passed on to those farmers sending product to the processor. It is assumed market prices will adjust so that pricing will also impact non-finishing farmers. <u>Note:</u> the horticulture and arable sectors may end up paying more than the NZ ETS given the additional admin costs involved in the alternative pricing systems. However, under both systems the lower your emissions the less you pay.					
	5(d): Recognises the wellbeing of rural communities and our people	Preserves/creates jobs in rural communities; Use employment/jobs as a measure	Similar to impact on profit/production above. All options use the same sequestration i.e. a focus on natives not exotics, and therefore suit an integrated/patchwork approach to farm-forestry.					

Traffic light	Explanation
	Strong positive
	Weak positive
	Neutral
	Weak negative
	Strong negative
	Uncertain
	Not applicable