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Summary for policymakers

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Scoping NZ ETS and removals pathways for better climate and nature outcomes

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Table of Contents

1 Introduction and key messages 1

2 The NZ ETS needs to evolve 4

2.1 Current NZ ETS design and settings are not adequate for the challenges ahead 4

2.2 Removals are essential but have limitations 7

2.3 The status quo NZ ETS will not deliver on New Zealand's climate targets 8

3 Voluntary nature and carbon markets face challenges alongside the NZ ETS 10

4 NZ ETS reform and a RIM can provide solutions 11

4.1 Updated objectives are needed for the NZ ETS 11

4.2 Alternative pathways are available for the NZ ETS and removals 12

4.3 A new RIM could complement all NZ ETS pathways 16

4.4 Guardrails are needed to build confidence in policy transition 18

5 Modelling offers insights on alternative pathways 19

5.1 Status quo (unconstrained removals in the NZ ETS) with and without a RIM 20

5.2 Pathway 2 (constrained removals in the NZ ETS) with and without a RIM 20

5.3 Pathway 3 (no removals in the NZ ETS) with a RIM 21

5.4 Implications for landowners 23

6 Other advanced economies are acting on removals 24

7 Conclusion: Collective effort is needed now to advance solutions 25

Appendix: Modelling analysis overview and highlights 27

Modelling analysis overview 27

Modelling assumptions for the illustrative RIM 28

Figures highlighting modelling outcomes 29

Modelling limitations for the illustrative RIM 34

Table of Figures

SPM Figure 1: Alternative pathways to the status quo for the NZ ETS and removals 12

SPM Figure 2: Conceptual relationship between NZ ETS pathway options, a RIM, and further policies 17

SPM Figure 3: NZ ETS emissions price (real 2025 NZD) under status quo policy settings from a range of models and reports, 2025–2060 29

SPM Figure 4: Net GHG emissions ($MtCO_2e$) under EBs using target accounting in a selection of status quo scenarios, 2025–2050 30

SPM Figure 5: Net GHG emissions excluding biogenic CH_4 ($MtCO_2e$) under the 2050 target using target accounting in a selection of scenarios for the status quo, 2025–2075 30

EMBARGOED

SPM Figure 6: Emissions prices (real 2025 NZD per tCO_2e) under NZ ETS pathway scenarios to meet the current net-zero and −20 $MtCO_2e$ 2050 targets for gases excluding biogenic CH_4, 2025–2050 31

SPM Figure 7: Gross emissions ($MtCO_2e$) under NZ ETS pathway scenarios to meet the current net-zero 2050 target for gases excluding biogenic CH_4, 2025–2050 31

SPM Figure 8: Afforestation under NZ ETS pathway scenarios with a RIM to meet the current net-zero 2050 target and −20 $MtCO_2e$ 2050 target for gases excluding biogenic CH_4, 2025–2050 (million ha) 32

SPM Figure 9: Fiscal outcomes under NZ ETS pathway scenarios with a RIM to meet the current net-zero and −20 $MtCO_2e$ 2050 targets for gases excluding biogenic CH_4, 2026–2050 (billion real 2025 NZD, undiscounted) 32

SPM Figure 10: Landowner economic returns (NPV/ha, real 2025 NZD) for production exotic forest planted at different future years under the modelled RIM and two scenarios for the status quo NZ ETS, 2030–2050 33

SPM Figure 11: Landowner economic returns (NPV/ha, real 2025 NZD) for indigenous reversion/regeneration in 2030, 2035, and 2040 under different policy options 33

SPM Figure 12: Landowner economic returns (NPV/ha, real 2025 NZD) for indigenous direct planting in 2030, 2035, and 2040 under different policy options 34

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1 Introduction and key messages

The New Zealand Emissions Trading Scheme (NZ ETS) places a price on greenhouse gas (GHG) emissions and incentivises forestry and other activities that remove carbon dioxide (CO_2) from the atmosphere, helping drive action on climate change. However, its current structure is not fit for purpose to manage the challenges ahead. As auctioning ends by the early 2030s – making unit supply fully dependent on forestry and other removals, industrial free allocation, and the participant-held stockpile – the Government will progressively lose its ability to manage unit supply and prices, ensure market stability, collect auction revenue, and align the NZ ETS with climate targets. The system trades off forestry removals against emissions reductions when they have different price points, demand drivers, investment horizons, and climate benefits. Associated unit price volatility and long-term unit price uncertainty discourage decarbonisation and indigenous afforestation and negatively impact business and government balance sheets. Over the next decade, as declining unit demand from emitters is projected to converge with increasing unit supply from forestry, the NZ ETS will be unable to cut net emissions further or drive significant planting of new indigenous forests. It will also fail to deliver on Aotearoa New Zealand's 2050 target for gases excluding biogenic methane (CH_4).

New Zealand has committed to help meet the Paris Agreement's temperature goal, and global action is off track. It is no longer possible to limit warming to 1.5°C above pre-industrial levels with no or limited overshoot. However, limiting warming to 2°C is still possible without overshoot if efforts to reduce emissions of all GHGs accelerate rapidly, with upscaling of CO_2 removal as an additional measure. In contrast, current global policies point to about 2.8°C of warming. Urgent action is needed globally to limit peak warming below 2°C and to minimise the magnitude and duration of overshoot of 1.5°C, enabling overshoot recovery. Key strategies are producing clean electricity, boosting electrification and energy efficiency, decarbonising hard-to-abate sectors, and scaling up removals activities.

Under current domestic policies, New Zealand faces net emissions reduction gaps of about 85 $MtCO_2e$ for its 2030 Nationally Determined Contribution (NDC) and 13–23 $MtCO_2e$ for its 2035 NDC, with no plan for how to close them. Five-yearly emissions budgets (EBs) set 15 years in advance are supposed to chart the path of progress. However, the Climate Change Commission's 2026 Emissions Monitoring Report finds New Zealand is at risk of missing EB2 (2026–2030) and off track for EB3 (2031–2035), despite NZ ETS settings being legally required to accord with delivering these budgets.

Alongside the climate crisis, New Zealand also faces a biodiversity crisis, with more than 75% of several groups of indigenous species threatened by or at risk of extinction. Nature-based

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solutions like forestry that both remove CO_2 from the atmosphere and protect and enhance ecosystems can deliver wins for climate and biodiversity. Compared to single-species, even-aged exotic forests, multi-species indigenous forests can be more resilient to natural disturbances and more beneficial for biodiversity.

The NZ ETS was intended to send clear long-term investment signals in line with New Zealand's climate targets. Instead, the current settings create investment risk for emitters and foresters, climate target risk for the Government, and intergenerational risk for New Zealanders. Policy reform is essential to avoid misdirected investment under the status quo. Greater voluntary investment in climate mitigation and nature conservation is also needed to bridge current funding gaps.

While recognising multiple reforms are needed to improve the NZ ETS, this paper focuses on a range of NZ ETS reform options for removals. It also explores how a new Removals Investment Mechanism (RIM) could operate alongside the NZ ETS to boost and diversify long-term funding for forestry and other removals. It presents the findings of initial analysis by a small team of independent researchers, with the goal of setting the stage for deeper research, cross-sector dialogue, and policy design to create an integrated policy framework that will deliver better outcomes for climate, nature, the economy, and communities.

This paper offers a direction of travel rather than a detailed proposal and implementation plan. Resolving the challenging issues raised in this paper will require collective efforts by officials, iwi and Māori, and diverse stakeholders. This summary for policymakers draws from the Motu Working Paper under the same title and a technical modelling insights brief, both available from https://motu.nz.[1]

SPM Box 1: Key messages

1. ***The NZ ETS must evolve*.** The NZ ETS is based on outdated assumptions and must evolve to deliver on Aotearoa New Zealand's climate targets and send clear long-term investment signals to emitters and foresters.
2. ***Under the status quo NZ ETS, the Government will lose control over outcomes.*** In its current form, the NZ ETS will soon become a rudderless ship caught in crosswinds. As auctioning ends by the early 2030s and unit supply becomes dependent on forestry and other removals, industrial free allocation, and the participant-held stockpile, the Government will progressively lose its ability to manage unit supply and prices, support market stability, collect auction revenue, and deliver on any intended climate target.

[1] Green, K. (2026). *Modelling insights brief: Outcomes of the NZ ETS under the status quo, policy alternatives and a removals investment mechanism*. Motu Economic and Public Policy Research. https://motu.nz.

3. ***Under the status quo NZ ETS, imbalance between unit supply and demand threatens climate targets***. From the mid-2030s, as falling unit demand by emitters is projected to converge with rising unit supply from forestry, the status quo NZ ETS will be unable to cut net emissions further or drive significant planting of new indigenous forests. It will also fail to deliver on New Zealand's 2050 target for gases excluding biogenic CH_4.
4. ***The status quo NZ ETS creates uncertainty and risk for removals investment***. Forestry and other removals are critical to preventing dangerous climate change, but the status quo limits both compliance and voluntary removals investment. Under offsets-driven emissions pricing, removals investment will decline with decarbonisation – when it should be increasing to meet the growing global need for removals as temperatures rise above 1.5°C. Uncertain long-term demand for removals creates investment risk for foresters.
5. ***The status quo NZ ETS is delaying decarbonisation***. The substitution of lower-cost and higher-risk removals for feasible emissions reductions creates intergenerational risks for New Zealanders. These risks come from a delayed transition to a low-emissions economy, lock-in to fossil fuel technologies with ongoing exposure to price shocks, and depletion of New Zealand's long-term removals potential.
6. ***Credible NZ ETS reform pathways are available***. The paper compares the status quo NZ ETS, which allows unconstrained forestry and industrial removals, with three reform pathways: boosted removals supply/demand in the NZ ETS, constrained removals supply/demand in the NZ ETS, and an NZ ETS covering gross emissions only with removals rewarded through a separate mechanism. All pathways involve trade-offs. Limits on removals in the NZ ETS could require increases in removals outside the NZ ETS to support New Zealand's climate targets.
7. ***A complementary Removals Investment Mechanism (RIM) could improve outcomes***. Under current settings, a single price signal cannot deliver both the decarbonisation and removals New Zealand needs in the long term. A RIM would combine government- and market-driven incentives with policies and regulations to value removals for their climate and wider benefits, such as biodiversity and resilience. A RIM could be used alongside any NZ ETS pathway to boost and diversify investment in forestry and other removals without displacing emissions reductions. This would help with meeting current climate targets – and more ambitious future targets in response to temperature overshoot.
8. ***Modelling suggests the concept of a RIM is worth pursuing, but more work is needed***. Depending on design, a RIM could be used to help maintain government control over climate targets and NZ ETS market stability, send clearer investment signals for emitters and foresters, generate net revenue for the Crown, and improve outcomes for climate and nature. It could be designed in ways that maintain or increase the value of existing and new removals investments relative to the status

quo NZ ETS. The RIM modelled in this paper is a hypothetical illustration for demonstrating proof of concept, not a proposal or recommendation, and additional approaches should be considered.

9. ***Policy change must enable a just transition*.** To avoid market disruption, government decision-making on the introduction of a RIM would need to be staged carefully; shaped and informed by inclusive processes with full regard to the rights, interests, and aspirations of iwi and Māori; and concluded well in advance of implementation. Process guardrails would be essential to build confidence in policy change and ensure a just transition for NZ ETS participants, iwi and Māori, broader stakeholders, and communities.

10. ***Policy development should start now***. Given the lead time required, the process of policy development should begin as soon as possible, while the Government still holds the lever of auctioning and before misdirected investment decisions driven by the status quo NZ ETS lock in adverse outcomes for decades. Deferring policy change beyond 2030 could forgo around $11–12 billion in auction revenue through 2035. A collective effort is required to build on the findings of this paper and design an integrated policy framework for the NZ ETS and removals that will deliver what is needed in the decades ahead.

2 The NZ ETS needs to evolve

2.1 Current NZ ETS design and settings are not adequate for the challenges ahead

The NZ ETS is a market-based mechanism designed to reduce GHG emissions and increase removals of CO_2 from the atmosphere, helping New Zealand meet its climate targets. These climate targets include the 2050 target set under the Climate Change Response Act 2002[2] – supported by five-yearly EBs – and NDCs under the international Paris Agreement.

The NZ ETS requires surrender of one New Zealand Unit (NZU) for every tonne of GHG emissions covered by the system. The market price for these units in turn provides an incentive to reduce emissions or to invest in activities like forestry that remove CO_2 from the atmosphere. Eligible removals activities generate NZUs that can be used to meet surrender obligations.

Operational since 2008, the NZ ETS was the first ETS in the world designed to cover every economic sector over time; however, this scope was never achieved. The system currently excludes emissions from agriculture (i.e. livestock and fertilisers), some synthetic gases, non-

[2] The two parts of the 2050 target are: (1) to reduce biogenic CH_4 emissions at least 10% below 2017 levels by 2030 and 14–24% below 2017 levels by 2050 and for each subsequent calendar year, and (2) to reduce all other GHGs to reach net zero by 2050 and for each subsequent calendar year.

municipal waste, wastewater, and international shipping and aviation. It currently operates as a domestic-only system. The NZ ETS is the only ETS globally that takes a sector-wide approach to forestry, with mandatory surrender of units for deforestation and the option of earning units for eligible post-1989 afforestation. There are no quantity limits on the number of forestry units that can be issued into the market or surrendered by NZ ETS participants to meet their obligations. Participants have accumulated a large unit stockpile – as of December 2025, this was 123.8 million units, equivalent to 3.6 times the annual surrender volume in 2024/25.

To date, exotic forestry has responded far more strongly to NZ ETS emissions prices than gross emissions have. Forestry removals supplied 47% of the NZUs issued from 2009 to 2025, with the remainder from free allocation, auctioning, and a fixed-price option which ended in 2021. A significant share of forestry NZUs is currently held against future harvest liabilities and not available to the broader market. Further contributors to cumulative unit oversupply were the system's acceptance of unlimited offshore Kyoto units from 2008 to mid-2015 and the fixed price option available from 2010 to 2021. Cumulative unit demand to date has been limited by the period in which non-forestry sectors surrendered one unit per two tonnes of emissions (introduced in 2010 and phased out before 2019) and by the exclusion of some sectors (particularly agriculture) from the system.

Key challenges to the effective operation of the current NZ ETS include:

- ***The sunset of auctioning***: Under current settings, auctioning must end in the early 2030s for NZ ETS unit supply to accord with EBs, given ongoing industrial free allocation and forestry removals. At this point, the Government will lose its primary lever to influence unit supply and prices – both critical for climate target alignment and market stability – and the fiscal benefits of auction revenue.
- ***Loss of market confidence in mitigation ambition***: Market confidence in mitigation ambition for covered sectors has been eroded by policy uncertainty and policy changes. Historically in the NZ ETS, emissions prices have been influenced heavily by market expectations of future policy stringency or leniency.
- ***Misalignment of unit supply with climate targets***: Under the current NZ ETS design, the Government cannot fully align unit supply with the intended contribution of NZ ETS sectors to New Zealand's climate targets. Contributing factors to the mismatch include unit banking and borrowing, industrial free allocation, and the lack of government levers for managing the volume and timing of removals units.
- ***The inability to incentivise mitigation beyond exotic forestry removals***: The NZ ETS is primarily driving the production of high-volume exotic forestry removals – which are lower cost and higher risk – as a substitute for gross emissions reductions. This enables investment in high-emitting activities to continue, delaying the necessary transition to a

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low-emissions economy. Low unit prices will also not incentivise investment in slower-growing, higher-cost indigenous forests or in highly durable or permanent engineered removals.

- ***Investment uncertainty for emitters and foresters***: Decarbonisation will be driven both inside and outside of government at an unpredictable pace. Whereas a sustained rise in unit demand and prices could favour removals investments, a sustained drop due to accelerated decarbonisation could strand them. Changes in government policy add to market uncertainty, one example being the Government's 2025 decision to restrict NZ ETS registration of exotic post-1989 forest converted from farmland. The broad range of scenarios for unit supply/demand and prices heightens investment risk for high-emissions industries, low-emissions innovators, and removals producers. Price volatility and long-term price uncertainty affect corporate balance sheets and the net NZ ETS financial position in the Crown accounts. Under long-term unit demand and price uncertainty, the most viable removals will be those that depend least on emissions pricing, which in New Zealand means exotic production forests.
- ***Non-price barriers to mitigation***: It takes more than emissions prices to transform an economy; regulation and investment shaped by long-term market expectations play complementary roles. To the extent non-price barriers to action are unresolved, emissions pricing will be less effective at driving mitigation.
- ***The prospect of adding further types of removals***: The Government has created policies to allow the addition of new removals activities to the NZ ETS (e.g. small-scale vegetation and wetland restoration). New types of removals could involve widely divergent features that are not suited to a market trading in NZUs as a uniform commodity.

Within New Zealand's current climate policy framework, the limited scope of the NZ ETS leaves important policy gaps that add to climate target risk. These include:

- ***Non-ETS emissions included in climate targets***: Although originally intended to cover all sectors of the economy over time, the NZ ETS excludes emissions of nitrous oxide (N_2O) from fertilisers and synthetic GHGs covered by a separate levy – both of which are part of the net-zero 2050 target for gases excluding biogenic CH_4. The NZ ETS also excludes biogenic CH_4 from agriculture. This means the NZ ETS does not incentivise reductions in those emissions – or removals to compensate for those emissions – to help achieve New Zealand's net-zero 2050 target and NDCs.
- ***Non-ETS removals that are – or could be – included in climate targets****:* The NZ ETS excludes two significant removals opportunities that are already part of New Zealand's 2050 target and NDCs: improved management of pre-1990 forest and of post-1989 forest under averaging after reaching its long-term average carbon stock. This means landowners

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are not rewarded for increasing carbon storage in those forests. The NZ ETS also excludes additional removals opportunities that could generate valuable climate benefits and potentially help with future climate targets, such as establishment of small-scale vegetation, wetland restoration, assisted natural forest regeneration after disturbance, and other land-management activities.

Climate targets for advanced economies in the coming decades may be net negative rather than net zero, to draw down excess CO_2 that has caused global temperatures to overshoot safe levels and to reflect a fair contribution by countries well placed to mitigate GHG emissions. Under current NZ ETS design, these additional removals will not be paid for by NZ ETS participants, who are obligated to surrender only one unit for every tonne of gross emissions. Placing the full removals burden for historical emissions onto residual emitters in hard-to-abate sectors would be inequitable and likely not economically viable. Mobilising long-term removals beyond the level of residual emissions is an important gap in both domestic and global climate policy.

2.2 Removals are essential but have limitations

Nature-based and engineered removals are essential for climate change mitigation and can deliver co-benefits for nature, although adverse impacts are also possible. But a tonne of CO_2 removed from the atmosphere is not necessarily equivalent to a tonne of CO_2 emitted. Climate-carbon cycle feedbacks make removals potentially less effective at lowering CO_2 than emissions are at raising it. More importantly, many removals are reversible; for example, forests are at risk of fire, pests, or diseases, which release their captured CO_2, whereas CO_2 emitted from fossil fuel combustion causes warming over millennia. It is harder to accurately measure carbon removals in forests and soils than emissions from energy and industrial activities, and this can reduce the climate equivalence of offsetting. Removals methods vary widely in their technical feasibility, mitigation potential, costs, and co-benefits. Some nature-based removals that appear lower cost in the near term may, in the long term, deliver less climate value, higher risk, and higher cost.

Removals supply is finite. There is a limited amount of land available to plant new forests, and as they mature, their ability to remove CO_2 diminishes. Once forest has been planted, the cost of changing land use again in future becomes prohibitively high in a low-emissions economy. Productivity gains in existing forest are possible but slow. Using removals to offset avoidable emissions forecloses their later use for hard-to-abate emissions and recovering from temperature overshoot, shifting the costs of transitioning to a low-emissions economy to future generations.

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Policy can count removals as complementary contributions to climate outcomes, alongside GHG emissions reductions. Alternatively, policy can allow use of removals as imperfect substitutes for emissions reductions with safeguards governing the quantity, type, or permanence of removals used. This choice has important implications for determining removals' demand, valuation, and climate benefits. Either alternative is preferable to the oversimplified presumption of full climate and market equivalence of emissions reductions and removals currently used in New Zealand's climate policy settings.

2.3 The status quo NZ ETS will not deliver on New Zealand's climate targets

Modelling analysis was used to explore possible outcomes under the status quo NZ ETS and alternative pathways.[3] Modelling is useful for exploring the potential implications of policies under different assumptions about how markets will respond. All models have limitations, and the data presented in this paper should not be interpreted as forecasts or predictions. Under real-world conditions, complex forestry decisions are shaped by landowners' expectations for NZ ETS unit demand and prices alongside other factors such as land values, timber and fuel prices, distance to market, environmental standards, land-use preferences, and business plans.

The modelling analysis suggests that under the status quo NZ ETS, unit demand will decline over time, irrespective of the emissions price applied, due to external drivers (e.g. changes in technologies, gas reserves, and other policies). In parallel, forestry unit supply is expected to increase given current emissions prices and the potential for further afforestation. By the mid-2030s, these trends are projected to converge, stalling further net emissions reductions. Unit prices are projected to increase to a peak level in the early 2030s under short-term supply constraints and then decline in the longer term as forestry removals increase and gross emissions decline. The potential for decarbonisation to accelerate unpredictably due to external drivers adds to uncertainty and investment risk for foresters. Over time, as existing production forests reach their long-term average and stop generating units, declining demand and emissions prices will discourage further planting and unabated gross emissions will continue. This means New Zealand will be unable to sustain its net-zero 2050 target for gases excluding biogenic CH_4.

SPM Table 1 presents a synthesis of outcomes under the status quo NZ ETS across the range of models and scenarios considered in this paper. The Appendix includes figures illustrating these data. A key insight from this analysis is the broad range of possible outcomes

[3] See the Appendix for an overview of the models and scenarios and Green (2026) for further detail.

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for emissions prices and net emissions across different models and scenarios driven by variable assumptions about market dynamics.

SPM Table 1: Range of modelled outcomes under the status quo NZ ETS

Indicator	Modelled status quo outcome
NZU price (real 2025 NZD)	Range of modelling peaks at $60–$105 in the 2030s; falls to $5–$55 by 2060
NZ ETS auction revenue	Average of ~$550m in EB2 and ~$245m in EB3; none from EB4 onwards
Forest estate (2025–2050)	Additional 865,000 ha of planted forest, 55,000 ha of natural forest, and 32,000 ha of deforestation (government central projection)
Emissions budgets	EB2 (2026–2030) met in all scenarios; EB3 (2031–2035) missed in most; recommended EB4 (2036–2040) missed in all by 21–63 $MtCO_2e$
2050 climate target for gases excluding biogenic CH_4	Between 4.5 $MtCO_2e$ over and 4.8 $MtCO_2e$ under net zero in 2050; net emissions subsequently rise above net zero post-2050

Note: Modelled results are not forecasts or predictions.

Under the status quo NZ ETS, no stakeholder group is well served in the longer term, and that heightens policy uncertainty and investment risk in the near term.

- For emitters, low and volatile unit prices and policy uncertainty make it hard to plan and justify decarbonisation investment.
- For foresters and landowners, returns ride on volatile and unpredictable unit prices and declining long-term unit demand. Indigenous forests and other higher-value removals cannot compete.
- For the Government, the early end of auctioning cuts off its primary lever over unit supply and prices as well as auction revenue, and the current NZ ETS structure places EBs, the 2050 target, and NDCs at risk.
- For iwi and Māori, the status quo NZ ETS and policy gaps for removals create barriers to realising the potential environmental, economic, and social benefits from both pre-1990 and post-1989 indigenous and exotic forestry on Māori land. Deeper discussion of these issues falls outside the scope of this paper; however, this remains a vitally important area for further research and policy development through tikanga-aligned processes.
- For all New Zealanders, a delayed low-emissions transition and heavy reliance on removals at risk of reversal lock in high-emissions investment, defer emerging opportunities for low-emissions economic development and innovation, and push costs onto today's youth and future generations.

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3 Voluntary nature and carbon markets face challenges alongside the NZ ETS

While compliance carbon markets remain the core market mechanism for addressing the goals of the Paris Agreement, voluntary carbon markets (VCMs) are now responsible for 2% of global carbon trades. VCMs are driven by organisations and individuals voluntarily offsetting or compensating for their emissions to lower their carbon footprints or achieve net-zero or carbon-neutral commitments. VCMs are guided by international standards and best practices rather than strict regulatory requirements.

There is growing interest in the complementarity between climate and biodiversity goals and the potential for integrating market mechanisms. Like VCMs, biodiversity credit markets have been operating for decades. Pressure to close the biodiversity funding gap has accelerated efforts to incentivise private investment in nature.

Over 2025 and 2026, the Government has supported the growth of privately run voluntary nature and carbon markets in New Zealand as a stand-alone policy. Voluntary market investment faces challenges to implementation at scale alongside the NZ ETS, including:

- ***Broad coverage of New Zealand's climate targets***: This makes it difficult to generate additional removals that are not counted, or likely to be counted, towards New Zealand's targets. This constrains the potential pool of buyers and unit value.
- ***Divergent domestic and international permanence standards***: The accounting practices used by New Zealand under its targets and the NZ ETS diverge from permanence protocols used in many international voluntary crediting programmes and emerging guidance under Article 6.4 of the Paris Agreement. These differences complicate combining voluntary contributions with NZ ETS compliance activities.
- ***An unclear domestic framework for voluntary markets***: The Government's new guidance and endorsement processes for voluntary nature and carbon markets do not address the trend towards convergence of voluntary and compliance markets globally, and the evolving relationship between voluntary nature and carbon markets.
- ***Uncertainty over long-term voluntary demand for removals***: Demand for removals beyond compliance obligations is currently driven by voluntary mitigation or nature targets for the purpose of demonstrating corporate responsibility. It is unknown how such demand will evolve and how removals will be valued over time in relation to compliance obligations as emitters decarbonise, especially as norms change around climate-contribution versus carbon-neutral claims.

These challenges make it difficult for New Zealand to attract voluntary investment – both domestic and international – motivated by generating positive climate and nature outcomes beyond government requirements.

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4 NZ ETS reform and a RIM can provide solutions

4.1 Updated objectives are needed for the NZ ETS

The NZ ETS was designed nearly 20 years ago on foundational assumptions that no longer hold. Prominent examples are provided in SPM Table 2.

SPM Table 2: Outdated assumptions and current realities for the NZ ETS

Policy considerations	Foundational assumptions	Current realities
Devolution of climate target obligations and costs to sectors	Target obligations, costs, and mitigation outcomes should be devolved to sectors.	Both public and private effort and funding are needed to achieve targets with public-good outcomes.
Least-cost compliance	Emissions pricing should deliver least-cost compliance with near-term targets.	Highest-value outcomes are needed from emissions pricing over the long term.
Domestic mitigation potential	New Zealand has few cost-effective opportunities to reduce domestic gross and net emissions.	Ambitious domestic emissions reductions and removals are technically and economically feasible.
Efficiency and equity	All sectors should face the same emissions price for efficiency and equity.	Blunt emissions pricing across diverse sectors by itself does not produce efficient or equitable outcomes, and some sectors have been shielded or excluded from emissions pricing.
Policy and market fungibility of emissions reductions and forestry removals	Emissions reductions and forestry removals are equivalent under climate targets and should be fungible under the NZ ETS.	Emissions reductions and forestry removals are not equivalent on climate, market, societal, or political terms. Enabling market fungibility creates investment and target risks as well as risks to rural communities.
Consideration of local effects	It does not matter to New Zealand where or how emissions reductions and removals occur, since they all benefit the climate.	Where and how emissions reductions and removals occur matters for our communities, landscape, economy, and national security.
Use of NZ ETS revenue	The NZ ETS is not intended to generate government revenue.	NZ ETS revenue can be directed for positive outcomes but will decline alongside decarbonisation.
International carbon market opportunities	Foresters will find ways to sell surplus units offshore through compliance and voluntary markets.	The Government can facilitate investment in domestic removals from international compliance and voluntary nature and carbon markets.

To prepare the system for the challenges ahead, this paper proposes eight objectives for future policy on the NZ ETS and removals:

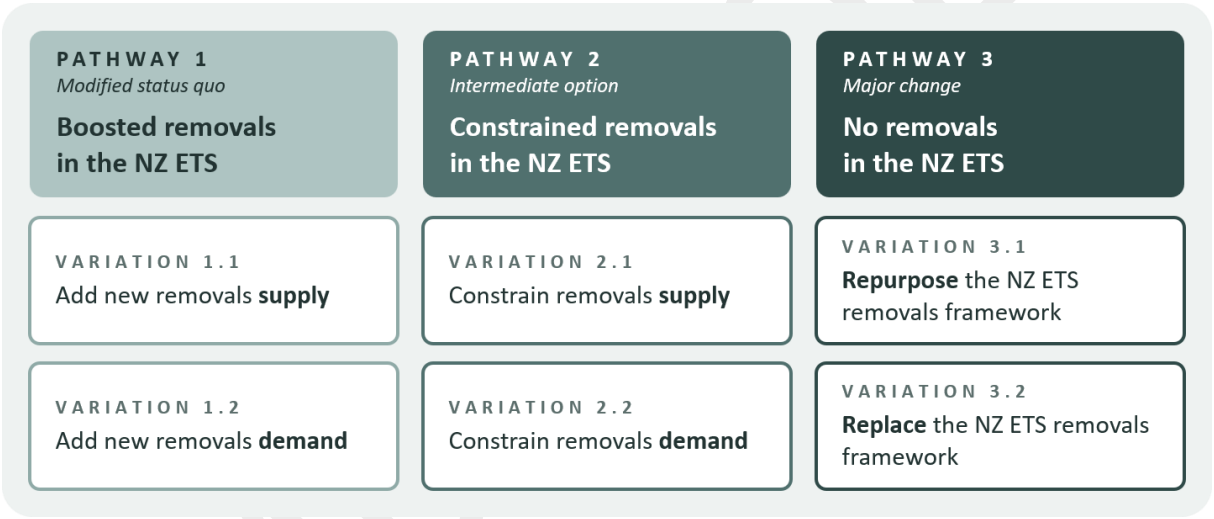
1. Sustaining governance over unit supply and prices to support climate targets and market stability
2. Delivering high-value outcomes across climate and other domains

3. Incentivising removals beyond NZ ETS emissions liabilities
4. Decoupling emissions prices for emissions reductions and removals
5. Sending clear investment signals for both emissions reductions and removals
6. Incentivising diverse removals with broader co-benefits
7. Enabling fiscally sustainable removals incentives
8. Encouraging domestic and international investment in New Zealand's removals from nature and carbon markets.

4.2 Alternative pathways are available for the NZ ETS and removals

This paper evaluates three NZ ETS pathway reform options as alternatives to the status quo. As shown in SPM Figure 1, these options are differentiated by their treatment of removals.

SPM Figure 1: Alternative pathways to the status quo for the NZ ETS and removals



Under **Pathway 1**, an expansion of the status quo, forestry and other removals would remain in the NZ ETS without constraints on their use to meet surrender obligations, with variations to introduce new sources of removals supply or removals demand. Introducing new removals supply could help diversify removals and make the system more resilient. Introducing new removals demand could help bridge climate target gaps and create economic opportunities for removals producers.

Under **Pathway 2**, removals would remain in the NZ ETS subject to quantitative or qualitative constraints on removals supply or demand. Such constraints could enable NZU prices to rise, supporting more ambitious decarbonisation. Depending on how the constraints were set, auctioning could continue for longer than under the status quo. Limits on removals in the NZ ETS could require increases in removals outside the NZ ETS to support New Zealand's climate targets. Examples of supply constraints could include registration quotas, eligibility limits, unit set-asides,

adjusted crediting, or vintaging. Examples of demand constraints could include surrender limits, exchange rates at the point of surrender, or supplementary surrender fees.

Under **Pathway 3**, the NZ ETS would trade only in gross emissions, although previously stockpiled forestry NZUs not held for future forestry liabilities could be retained in the system to honour past investments and support market continuity. New removals (whether from previously registered or new removals activities) would be incentivised through an external mechanism. Future forestry liabilities for deforestation or for harvesting of post-1989 forest under stock change accounting in the NZ ETS would be managed through the external mechanism, and forest owners could transfer stockpiled NZUs to the mechanism for that purpose. New NZU supply would come from auctioning and industrial free allocation. When setting auction volumes, the Government would have regard to the contribution to climate targets from removals generated outside the NZ ETS. The relative contributions of emissions reductions and removals to meet climate targets would be determined through government policy rather than the NZ ETS market. To implement Pathway 3, the Government could either repurpose or replace the NZ ETS removals framework.

Note that the pathway variations discussed above are not mutually exclusive. For example, adding new removals demand (assigned to Pathway 1) could also be considered under Pathways 2 and 3.

Three additional pathway options are identified in the paper but not analysed further: (1) combining the status quo for the NZ ETS with complementary incentives for gross emissions reductions, (2) combining a gross-emissions NZ ETS with a land-sector ETS, and (3) replacing the NZ ETS with a carbon tax or sectoral policies and regulations. These options would introduce further complexities but could be considered in future work.

SPM Table 3 provides more detail about NZ ETS pathway options and their implications. Under all NZ ETS pathways, including the status quo, it would be possible to design incentives for removals outside the NZ ETS. Introducing external removals incentives could produce different outcomes for the volume, type, timing, and value of removals – and the potential to achieve more ambitious future climate targets – across NZ ETS pathway options. Depending on design, splitting removals incentives inside and outside the NZ ETS could lead to windfall gains and losses for some removals producers, with equity and efficiency implications for the broader removals market relative to managing removals incentives under one mechanism.

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SPM Table 3: The range of NZ ETS pathway options in this study

Pathway	Variation	Strengths and weaknesses
Status quo: **Unconstrained removals in the NZ ETS**	N/A	Avoids policy change but: • Auctioning ends in the early 2030s and least-cost removals displace gross emissions reductions, creating climate target and investment risk and limiting co-benefits from removals • Non-ETS removals are needed to bridge target gaps for gases outside the NZ ETS, but no existing mechanism can deliver this at scale • Adding external removals incentives could divide the removals market and create windfall gains or losses, and auction revenue is insufficient to cover their costs
Pathway 1: **Boosted removals in the NZ ETS (modified status quo)**	**Variation 1.1: Add new removals supply** (e.g. new nature-based and/or engineered removals)	Could diversify removals but: • Auctioning ends in the early 2030s and least-cost removals displace gross emissions reductions, creating climate target and investment risk and limiting co-benefits from removals • New removals sources could add to unit oversupply, exacerbating climate target and investment risk • The supply of more diverse removals with variable durability and measurement certainty could result in market incoherence and political controversy • Adding external removals incentives could divide the removals market and create windfall gains or losses, and auction revenue is insufficient to cover their costs
	Variation 1.2: Add new removals demand (e.g. new sectors, new surrender obligations, government as buyer, voluntary cancellation, or ETS linkage)	Could diversify removals and help bridge target gaps but: • Auctioning ends in the early 2030s and least-cost removals displace gross emissions reductions, creating climate target and investment risk and limiting co-benefits from removals • Distributional effects from new NZ ETS obligations need to be managed for equity • Adding external removals incentives could divide the removals market and create windfall gains or losses, and auction revenue is insufficient to cover their costs
Pathway 2: **Constrained removals in the NZ ETS (intermediate option)**	**Variation 2.1: Constrain removals supply** (e.g. registration quota, eligibility limit, unit set-aside, adjusted crediting, or vintaging)	Partially decouples unit demand and prices for gross emissions reductions and removals and permits further auctioning but: • Reduced afforestation in the NZ ETS adds to climate target and investment risk

Pathway	Variation	Strengths and weaknesses
		• Quantity constraints require political judgements and incentivise least-cost, higher-risk removals, limiting co-benefits • Rising unit prices could trigger switching of stock-change forests from production to permanent, adding unit supply • Adding external removals incentives could divide the removals market and create windfall gains or losses, and auction revenue is insufficient to cover their costs
	Variation 2.2: Constrain removals demand (e.g. surrender limit, exchange rate at the point of surrender, or supplementary surrender fee)	Partially decouples unit demand and prices for gross emissions reductions and removals and permits further auctioning but: • Reduced afforestation in the NZ ETS adds to climate target and investment risk • Quantity constraints require political judgements and incentivise least-cost, higher-risk removals, limiting co-benefits • Adding external removals incentives could divide the removals market and create windfall gains or losses, and auction revenue is insufficient to cover their costs
Pathway 3: **No removals in the NZ ETS (major change)**	**Variation 3.1: Repurpose the NZ ETS removals framework**	Extends auctioning, fully decouples unit demand/prices for gross emissions reductions and removals, lowers climate target and investment risk, diversifies removals, manages all removals under a common policy mechanism, capitalises on the existing policy framework, and opens opportunities for voluntary removals investment but: • The new framework retains weaknesses for removals accounting and management in the current NZ ETS • More substantial policy change raises transition risk for emitters, foresters, and the Government
	Variation 3.2: Replace the NZ ETS removals framework	Extends auctioning, fully decouples unit demand/prices for gross emissions reductions and removals, lowers climate target and investment risk, diversifies removals, manages all removals under a common policy mechanism, enables maximum removals policy innovation, and opens opportunities for voluntary removals investment but: • More substantial policy change raises transition risk for emitters, foresters, and the Government

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Under all NZ ETS pathway options, further policies would be needed to make emissions pricing more effective, address non-price barriers to mitigation, and manage the distributional effects of climate policies, such as the rising price impacts of high-emissions goods and services on low-income households during the transition to low-emissions alternatives.

As shown in SPM Table 3, Pathway 3 – which combines a gross-emissions NZ ETS with external incentives for removals – offers multiple strengths compared to the other pathways. Pathway 3 would:

- Maintain government control over unit supply and prices in the NZ ETS and achievement of climate targets
- Fully decouple demand and unit prices for emissions reductions and removals so that policy and investment could reflect their differing benefits and rates of change
- Support removals diversification in line with government priorities
- Enable more comprehensive coverage of removals under a single policy mechanism
- Open opportunities to integrate voluntary investment in removals.

Pathway 3 would involve the most significant policy transition, making it the most vulnerable to extended policy uncertainty or poor policy design choices which could impact negatively on market confidence. However, the status quo and Pathways 1 and 2 also involve policy risks affecting market confidence.

This analysis shows the NZ ETS alone cannot deliver what is needed to achieve New Zealand's climate targets or send clear investment signals to emitters and removals producers. From this analysis, a core question emerges for further work by policymakers: what policy package would deliver the incentives for gross emissions reductions and diverse removals needed to achieve New Zealand's climate, nature, economic, and social goals?

Answering that question requires a national conversation about how to design a system that will work better for everyone. In the past, whenever a suggestion has surfaced to constrain or transfer forestry removals currently in the NZ ETS, it has appeared that policy change would risk devaluing previous and future forestry investments. Today's reality is that the status quo will risk devaluing previous and future forestry investments. Collective effort is needed to create a pathway for NZ ETS reform that improves on the status quo.

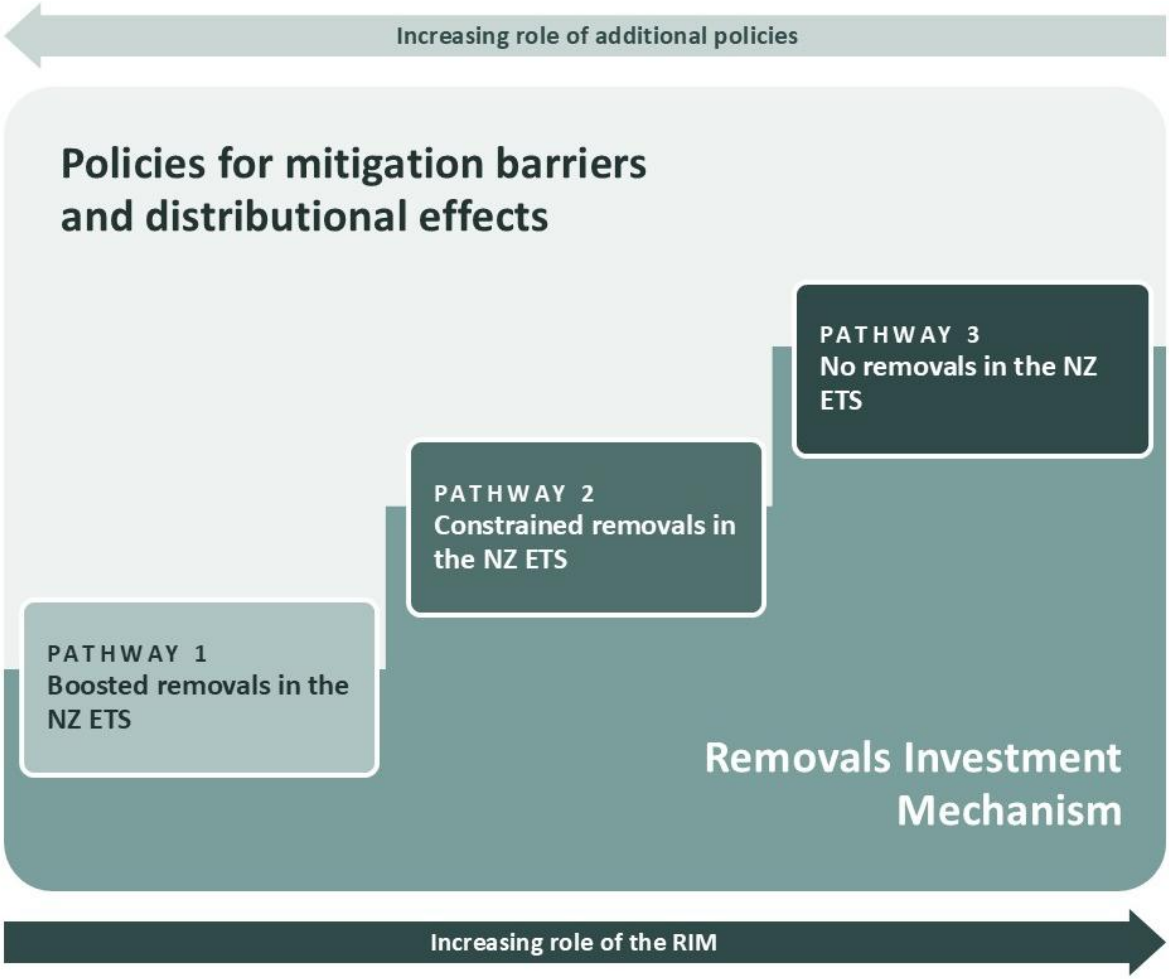
4.3 A new RIM could complement all NZ ETS pathways

A RIM is an integrated package of government- and market-driven incentives, supported by policies and regulations, to boost long-term and large-scale investment in high-quality and diverse removals alongside gross emissions reductions. It could operate either independently from an NZ ETS trading only in gross emissions (Pathway 3) or in conjunction with an NZ ETS

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trading in both gross emissions and removals (status quo and Pathways 1 and 2, to different extents). As shown in SPM Figure 2, the role of the RIM would increase with greater constraints on removals in the NZ ETS, and the role of supporting mitigation policies would increase alongside greater reliance on least-cost forestry removals to achieve climate targets.

SPM Figure 2: Conceptual relationship between NZ ETS pathway options, a RIM, and further policies



Designing a RIM would require decisions on (a) an overall architecture with effective policy levers, (b) specific policy settings for achieving government objectives, and (c) who would be eligible or required to participate in the RIM. Key design challenges include:

- ***Objectives and eligibility*:** Defining the role of removals in New Zealand's climate policy, potentially through removals sub-targets, and deciding on removals eligibility with consideration of permanence, non-carbon revenue potential, co-benefits, and other factors
- ***Demand, policy mix, and value*:** Increasing regulatory and voluntary demand for removals, tailoring policy instruments to regulatory and investment needs and barriers, and valuing removals on value-for-money terms across climate and additional domains such as biodiversity, resilience, and ecosystem services rather than the NZU price

- ***Funding*:** Mobilising public funding sources (e.g. NZ ETS auction revenue, taxpayer funds, sovereign green bonds, and/or sector levies) alongside private and voluntary finance, and deciding how to allocate funding
- ***Measurement, reporting, and verification (MRV) and accounting rules**:* Choosing methods for MRV and accounting that are suited to the climate and other benefits of removals, consistent with principles of environmental integrity, aligned with policy and funding needs, and practical for end-users and regulatory agencies to follow
- ***Channelling removals for different end-uses and developing feedback loops and exit strategies**:* Deciding how the pipeline of removals should be distributed across different end-uses (e.g. target achievement, voluntary markets), and creating feedback loops and exit strategies to ensure long-term policy effectiveness as end-uses and expectations change over time.

A process of NZ ETS reform, coupled with the introduction of a RIM, would provide an opportunity to better integrate voluntary nature and carbon market activities with New Zealand's domestic and international targets and with the NZ ETS, providing greater investment confidence. Through strategic design, a RIM could make it possible to:

- Refine New Zealand's removals methodologies for greater compatibility with international voluntary market standards
- Enable removals to be funded via voluntary markets (where buyers are willing) while retaining backstop funding via the RIM to manage risk for removals that count towards national climate targets
- Provide clarity on how investment in New Zealand removals can link to international compliance demand related to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) or other countries' NDCs under the Paris Agreement.

4.4 Guardrails are needed to build confidence in policy transition

Government decision-making on the introduction of a RIM would need to be staged carefully, with key strategic decisions to include:

- What role the NZ ETS and removals should play in achieving New Zealand's broader climate, nature, economic, and social objectives
- Whether the RIM should replace or complement the crediting of removals in the NZ ETS
- How to drive and distribute demand and funding for removals activities under the RIM.

Government decisions would need to be shaped and informed by inclusive processes with full regard to the rights, interests, and aspirations of iwi and Māori, and decided well in advance of implementation. Suggested principles that could be adopted during the process of decision-making as guardrails for policy transition include:

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1. Giving effect to the principles of Te Tiriti o Waitangi
2. Climate integrity
3. Improved outcomes for nature and resilience
4. NZ ETS market stability
5. Just transitions
6. Fiscal and administrative feasibility
7. Staged and well-signalled decisions with cross-party and public engagement and consultation
8. Choosing action over delay.

It would be critical to ensure a just transition for NZ ETS participants, iwi and Māori, broader stakeholders, and communities. As part of this, the RIM should be designed to maintain or increase the value of existing and new removals investments by NZ ETS participants relative to the status quo. For example, this could include scenarios where removals producers earn higher returns with lower risks for removals delivered. Policy transition should also avoid perverse outcomes like increased deforestation, or disruption to existing contracting arrangements for NZ ETS participants and settlements under Te Tiriti o Waitangi.

5 Modelling offers insights on alternative pathways

Modelled scenarios were analysed for preliminary insights on how alternative pathway options for the NZ ETS could affect emissions prices, climate targets, afforestation, and fiscal outcomes with and without a RIM.

The modelled scenarios should not be interpreted as policy proposals or recommendations, and the modelled results should not be interpreted as forecasts or predictions. The aim was to illustrate a range of possible solutions to demonstrate proof of concept as a basis for further discussion. Elements from different scenarios could be mixed, and other approaches that are not modelled here should also be considered in future policy development.

In an illustrative RIM developed for this scenario analysis, two distinct streams of forestry-related funding were modelled:

1. Providing an ongoing incentive to forests that are transferred from the NZ ETS
2. Incentivising new afforestation.

While additional funding streams could be applied to other nature-based and engineered removals, these were not included in modelled scenarios at this stage of research. The modelling also provides no estimates of the broader nature-based benefits from alternative pathways.

For illustrative purposes, the area of new afforestation funded was assumed to be distributed across four types of afforestation (consistent with the previous 1 Billion Trees

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Programme) as follows: indigenous reversion/regeneration (40%), indigenous direct planting (27%), permanent exotic (20%), and production exotic (13%). Exotic forests were assumed to receive recurring payments for carbon sequestration for a set length of time. Indigenous forests were assumed to receive both establishment and recurring payments. Establishment payments were assumed to cover full establishment costs. Relatively higher recurring payments were assigned to indigenous forests, providing for adequate forest management to realise both carbon and other benefits. The assumed payment structure and rates for the different forest types and additional modelling assumptions for the transfer of forests already registered in the NZ ETS are summarised in the Appendix. These assumptions are illustrative placeholders, not proposals or recommendations.

Modelled pathways were evaluated with the objective of achieving two levels of the 2050 target for gases excluding biogenic CH_4:

- New Zealand's current net-zero target
- The Climate Change Commission's recommended target of −20 $MtCO_2e$.

Key insights from the modelling analysis are provided below for each pathway and for landowners investing in exotic or indigenous forestry. Figures supporting these findings are provided in the Appendix.

5.1 Status quo (unconstrained removals in the NZ ETS) with and without a RIM

Under the status quo NZ ETS without a RIM, declining emissions prices would stall decarbonisation and, combined with policy gaps for non-ETS emissions and removals, fail to reach and/or sustain the 2050 target for gases excluding biogenic CH_4. Auctioning would stop and no auction revenue would be generated from the early 2030s. Similar outcomes would be expected for Pathway 1 (not modelled), which would boost removals relative to the status quo.

Implementing a RIM alongside the NZ ETS would reduce risks to the current 2050 target for gases excluding biogenic CH_4 – and could help achieve more ambitious future climate targets – but low NZ ETS auction revenue could not fund it.

5.2 Pathway 2 (constrained removals in the NZ ETS) with and without a RIM

The impacts of hypothetical constraints on NZ ETS removals without a RIM would vary by design.

- If new removals unit supply were limited to indigenous forests and existing NZ ETS forests remained in the NZ ETS, the 2050 target for gases excluding biogenic CH_4 would be met

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only if rising prices triggered switching of previously planted stock-change exotic forests from production to permanent. With switching, auctioning would stop and no auction revenue would be generated from the early 2030s. Switching land use involves complex decisions, and the associated modelling assumptions are subject to uncertainty. If desired, the Government could choose to introduce restrictions on switching between production and permanent forest.

- If a strict annual limit of 20,000 ha applied for new registrations of exotic forests, the current 2050 target for gases excluding biogenic CH_4 would not be met. Auction revenues and overall afforestation in the long term would be about the same as the status quo.
- If an exchange rate were applied to exotic forestry units, such as by requiring two forestry units per tonne of gross emissions, the NZU price would rise substantially by 2040 (with a modelled outcome of $250), and the current 2050 target for gases excluding biogenic CH_4 would be met and sustained. There would likely be a significant shortage of units in the late 2020s, but no auctioning or auction revenue in the long term.
- If new removals were limited to indigenous forests and all exotic forests were transferred out of the NZ ETS and not incentivised elsewhere, NZU prices would need to rise markedly (reaching $381 by 2050) to meet the 2050 target for gases excluding biogenic CH_4.

Under Pathway 2 with a RIM, the dynamics would resemble those under the status quo for most options considered. Significant funding would be needed to raise New Zealand's ambition to achieve a −20 $MtCO_2e$ 2050 target, with little auction revenue to draw on.

5.3 Pathway 3 (no removals in the NZ ETS) with a RIM

Under a gross-emissions NZ ETS with a RIM, gross emissions were assumed to follow either the EB4 demonstration pathway or the HTHS[4] pathway scenarios in the 2024 advice from the Climate Change Commission. These scenarios assumed a fixed pathway for NZU prices. The current net-zero 2050 target for gases excluding biogenic CH_4 would be met and sustained. It would become possible for New Zealand to reach the more ambitious 2050 target of −20 $MtCO_2e$ for gases excluding biogenic CH_4 recommended by the Climate Change Commission in 2024. These scenarios would enable auctioning to continue indefinitely, enabling governance over unit supply/prices and market stability, and generating auction revenue. Under the assumed NZU price pathway, the amount of auction revenue would more than cover the cost of the RIM through 2050, producing a net positive fiscal outcome for the Crown under both the current and more ambitious 2050 targets.

[4] High technology, high systems change.

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Under the status quo and Pathway 2 variations driven by least-cost outcomes, indigenous afforestation would be low. The modelling shows how a RIM could be used to encourage greater indigenous afforestation, but this would require revenue that could not be supplied by NZ ETS auctioning when NZU prices were low and auctioning ended early. In contrast, Pathway 3 would provide both a mechanism for the Government to incentivise indigenous afforestation and the auction revenue to fund it.

Further benefits from removals could be achieved by expanding the RIM to include incentives for improved management of existing forest (both pre-1990 forest and post-1989 forest under averaging after reaching its long-term average carbon stock), other land-use activities like small-scale vegetation and wetland restoration, and engineered removals. The RIM could also be configured to facilitate investment in voluntary nature and carbon markets.

Pathways 2 and 3 would generate higher NZU prices than the status quo. While supporting greater decarbonisation in line with New Zealand's climate targets, this would also impact on NZ ETS market participants, other businesses, households, and iwi and Māori. Under scenarios in which auctioning continued, the Government would be able to guard against extreme price outcomes using the auction reserve price and cost containment reserve. Those price controls would lose effect when auctioning ended.

In its 2024 advice, the Climate Change Commission assessed the economic and social impacts of higher mitigation costs under its recommended pathways for EB4 and a revised 2050 target. It concluded the economy would continue to grow in both cases, and ensuring just transitions across sectors, regions, and socioeconomic groups would require supporting policies. Modelling suggests the recommended EB4 pathway would have a negligible impact on GDP growth compared to the reference case. Under the more ambitious revised 2050 target, GDP would be about 1% lower than the reference case in 2040 and about 5% lower in 2050. That revised target would result in around a third less warming in 2100 than the original 2050 target (subsequently weakened in 2025). The Commission's cost assessment did not account for additional productivity gains and co-benefits from greater decarbonisation, or the value of avoided climate damages. For reference, the range of NZU prices in the alternative pathway scenarios modelled in this paper is generally in line with or below emissions price projections in the UK ETS and the EU ETS.

Under all NZ ETS pathway options, including the status quo, additional policies would be needed for the economy to overcome non-price transition barriers, respond efficiently to emissions price signals, and achieve desired sectoral outcomes. Such policies would help avoid unnecessarily high emissions prices and support just transitions for sectors and communities. As an example, research by Beca and Sapere published in 2026 found that combining a credible and

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predictable emissions price with strategic sectoral policies and investment for decarbonisation could significantly boost benefits for GDP and the climate compared to an emissions price alone.

5.4 Implications for landowners

A RIM could potentially provide landowners with more predictable demand and price outcomes for forestry removals relative to the status quo NZ ETS. The outcomes for exotic and indigenous afforestation under the illustrative RIM relative to the status quo vary by modelled scenario across alternative NZ ETS pathways. The modelled outcomes are not forecasts or predictions.

For **exotic production forests**, the status quo NZ ETS would initially provide higher returns than the modelled RIM, but in status quo scenarios with declining NZU prices, exotic afforestation would be better off in the RIM from the mid-2030s. The Pathway 2 (constrained removals) options that significantly increased NZU prices would improve returns for the forests remaining in the NZ ETS relative to the status quo and the RIM. However, this outcome would raise substantial equity concerns, with some post-1989 forests in the NZ ETS receiving well above what might be paid for new afforestation through the RIM (or for additional carbon stored by pre-1990 forests). This would significantly distort rural land values, creating stark winners and losers. Resulting market distortions would likely increase price volatility and make it significantly harder to align NZ ETS outcomes with New Zealand's EBs and 2050 target.

For **indigenous afforestation** (both reversion/regeneration and direct planting), landowners would be better off under the modelled RIM than the status quo NZ ETS. However, modelled returns would be highest under the Pathway 2 option in which exotic forests were entirely removed from the NZ ETS. Very high NZU prices would produce high returns for both indigenous reversion/regeneration and direct planting. These returns would be competitive even with some dairy farms, so this option could remove the need for a RIM altogether. However, the broader impacts on land prices, land-use change, nursery capacity, and workforce capability would be significant, and are not captured in the modelling. Returns would also be highly sensitive to future government choices on NZ ETS price settings, increasing uncertainty for indigenous foresters about the returns they can reasonably expect in practice. Under the Pathway 2 option in which new exotic forests were prevented from entering the NZ ETS but previously registered exotic forests remained, economic returns for indigenous reversion/regeneration would exceed those under the modelled RIM. However, direct planting of indigenous forest would not be cost-effective under this option. This reflects the high establishment costs of direct planting, which the NZ ETS does not fund but the modelled RIM would.

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As a high-level scoping exercise, the modelling analysis in this paper did not assess the potential transitional impacts of policy change on forests already registered in the NZ ETS, which (depending on the pathway) could either remain in the NZ ETS or be transferred to a new RIM. These impacts could vary depending on the process used for decision-making and the policy design that emerged. As discussed above, to maintain market confidence, the process of policy transition would need to be informed by extensive engagement and consultation, signalled well in advance, and implemented in ways that maintained or improved the returns to foresters relative to the status quo. The modelling analysis also did not assess what level of funding would be required to operate the RIM indefinitely (i.e. funding new afforestation beyond 2050) or how that funding would be sourced.

While the illustrative RIM presented in this paper is limited by modelling constraints and simplified assumptions (described in the Appendix), it does shed light on a possible direction for New Zealand's climate change policy for the NZ ETS and removals that could improve outcomes for climate, nature, the economy, and communities.

6 Other advanced economies are acting on removals

New Zealand is not alone in facing these challenges, but its current policy framework for the NZ ETS and removals is unique in many regards.

Among advanced economies, the UK and seven European countries have committed to net-negative emissions targets and/or separate targets for GHG removals in addition to overall gross emissions reductions. The scope, timing, and accounting methods for these targets vary. In some advanced economies, governments are supporting carbon removals through mechanisms such as compliance-market crediting, domestic credit certification for the voluntary market, establishment grants, guaranteed prices, and tax credits.

Other cap-and-trade systems that currently allow forestry offsets tend to limit their use to a relatively small percentage of surrenders (typically 5–10%). Key examples are the systems in California and Québec, Canada (federal), China, Japan, the Republic of Korea, and Washington. The US-based Regional Greenhouse Gas Initiative will remove offsets from 2027. Australia's Safeguard Mechanism (a baseline-and-credit system), which accepts Australian Carbon Credit Units (ACCUs) from vegetation and soil carbon, does not apply a hard limit, but usage above 30% needs to be explained.

Notable points of difference between New Zealand's treatment of removals in the NZ ETS and systems in other countries for incentivising removals include:

- Several systems with offsets crediting use a counterfactual test for additionality, whereas the NZ ETS uses a 1990 base year for its eligibility test.

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- In several systems, public funding for removals comes with conditionality to drive desired outcomes and co-benefits, whereas outcomes from the NZ ETS are driven by emissions prices decided by a market with full fungibility of removals and emissions reductions.
- Several systems require up-front measures as safeguards against future reversals, such as credit buffers and insurance, whereas the NZ ETS assumes permanence will be maintained through perpetual reversal liabilities and averaging for production forests.

7 Conclusion: Collective effort is needed now to advance solutions

While emissions pricing remains critical to New Zealand's low-emissions transition and the NZ ETS market is functional, modelling suggests that status quo design and settings for the NZ ETS and removals will fail to deliver on New Zealand's climate targets and create uncertainties and risks across stakeholder groups in the longer term. The challenges facing the NZ ETS are significant but not insurmountable. They come from policy assumptions and design choices made nearly two decades ago, and those choices can be revisited. New Zealand now has a clear opportunity to build a policy framework that will deliver what is needed for the decades ahead. Such a framework would recognise that emissions reductions and removals are both essential and would invest in each on its own merits. Doing so would send clearer long-term investment signals to emitters and removals producers alike. It would also restore the Government's ability to steer the NZ ETS towards New Zealand's climate targets and unlock a far wider range of removals than exotic afforestation alone. Those removals could deliver benefits for climate, nature, regional economies, and communities.

The analysis in this paper points to a promising direction. A RIM could be applied alongside any of the NZ ETS pathway options explored in this paper to achieve outcomes for removals and climate targets that would not be possible otherwise. Under illustrative modelling, a RIM could potentially be used to help meet and sustain New Zealand's current 2050 target and bring more ambitious future targets within reach. By enabling auctioning to continue, it could help maintain government control over climate targets and NZ ETS market stability and generate net revenue for the Crown. Separating demand and price signals for emissions reductions and removals could send clearer investment signals for emitters and foresters and improve outcomes for climate and nature. A RIM could potentially be designed in ways that maintain or increase the value of existing and new removals investments relative to the status quo NZ ETS. The RIM modelled in this paper is a hypothetical illustration for demonstrating proof of concept, not a proposal or recommendation, and more work is needed. This direction is consistent with what forward-

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looking advanced economies are already doing: setting removals targets and building diverse incentive portfolios alongside ambitious emissions reductions.

Policy development should begin as soon as possible, while the Government still holds the lever of auctioning and before low emissions prices lock in misdirected investments that will not serve New Zealand in the longer term. Deferring policy reform beyond 2030 could forgo around $11–12 billion in auction revenue through to 2035 that could otherwise fund removals or other priorities. Government decision-making on the introduction of a RIM would need to be staged carefully; shaped and informed by inclusive processes with full regard to the rights, interests, and aspirations of iwi and Māori; and concluded well in advance of implementation. Process guardrails would be essential to build confidence in policy change and ensure a just transition for NZ ETS participants, iwi and Māori, broader stakeholders, and communities. Collective effort is needed to build on the findings of this paper and design an integrated policy framework for the NZ ETS and removals that works better for everyone.

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Appendix: Modelling analysis overview and highlights

This appendix begins with an overview of the modelling analysis from Green (2026) supporting the findings in this paper. It provides information about key assumptions for modelling the illustrative RIM. It then provides a series of figures highlighting the most significant modelling outcomes for this paper. It concludes with a description of the modelling limitations for the illustrative RIM.

Modelling analysis overview

As detailed in Green (2026), the modelling analysis in this paper draws from scenarios across:

- The Ministry for the Environment (MfE) NZ ETS market model
- NZUpy: an open-source Python-based NZ ETS optimisation model
- Modelling prepared by Concept Consulting for the Parliamentary Commissioner for the Environment (PCE) in 2026 using the Emissions in New Zealand (ENZ) model
- Scenarios published by the Government and the Climate Change Commission drawn from ENZ and sector-specific projection models.

Variations across models are driven by differences including:

- The response of exotic afforestation to emissions prices
- The rate of indigenous afforestation
- The degree of market liquidity, including the potential for participant borrowing from the private stockpile
- Whether dynamic switching is enabled between permanent and production stock-change exotic forestry during the lifetime of a forest (with foresters able to defer harvest when this is due)
- Whether emissions price trajectories are constrained.

Model runs attempt to reflect these uncertainties as follows:

- ***Afforestation response***: The two MfE NZ ETS market model scenarios presented reflect conditions in which there is constrained afforestation or responsive afforestation (higher responsiveness to emissions price).
- ***Forest management flexibility***: The PCE scenarios presented allow endogenous switching from production forestry to permanent forestry when harvest is due, depending on the relative returns of each.
- ***Market liquidity***: The scenarios presented for NZUpy see liquid market conditions (with greater levels of borrowing from the stockpile) and relatively more illiquid market conditions (with minimal borrowing).

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Modelling assumptions for the illustrative RIM

SPM Table 4 presents modelling assumptions for funding to landowners under an illustrative RIM. SPM Table 5 presents additional modelling assumptions for transferring registered forests to an illustrative RIM. These assumptions are illustrative placeholders, not proposals or recommendations.

SPM Table 4: Modelling assumptions for funding to landowners under an illustrative RIM

Variable	Indigenous reversion	Indigenous direct planting	Exotic permanent	Exotic production
Establishment payment	$3,000/ha	$20,000/ha	$0	$0
Recurring payment for removals	$50 per tCO_2e			
Recurring payment for additional benefits	$40 per tCO_2e		n/a	
Payment length	50 yrs	50 yrs	50 yrs	16 yrs
Landowner discount rate	6%	6%	8%	8%
NPV term	60 yrs	60 yrs	60 yrs	30 yrs
Total payments received from RIM (present value)	$12,000/ha	$31,000/ha	$12,000/ha	$12,200/ha

SPM Table 5: Additional modelling assumptions for transferring registered forests to an illustrative RIM

Modelling parameter	Assumption
Funding source	NZ ETS auction revenue
Government administration costs	20% increase relative to current NZ ETS
Costs for MRV, compliance, cost recovery, enforcement, and administration	Comparable to current NZ ETS
Reversal risk management	Not addressed
Government discount rate	Treasury's social rate of time preference (SRTP), with mandatory sensitivity test of 8%
Funding period	2030 to 2050 (21 years)
Breakdown of exotic forests under stock-change accounting	20% permanent and 80% production
Area of registered forest	Constant with transfer (no deregistration assumed)
Afforestation partnerships on Crown land	Continue independently from the RIM

Figures highlighting modelling outcomes

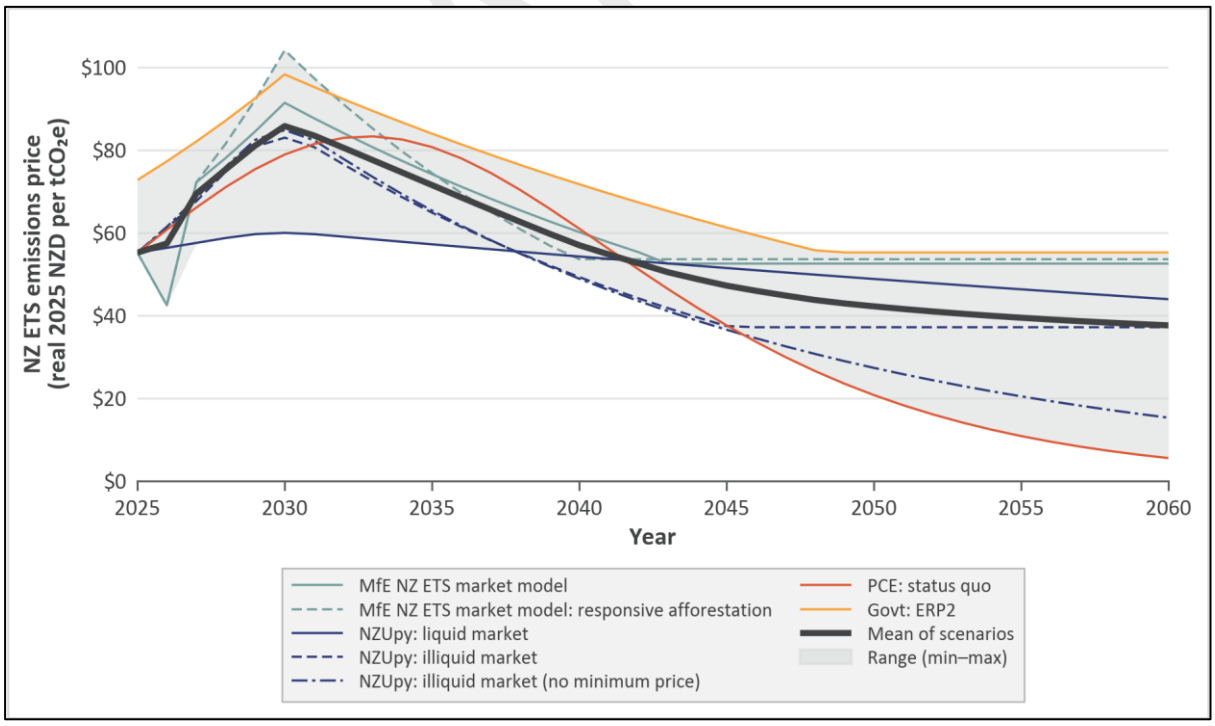
SPM Figure 3 compares modelled outcomes under the status quo NZ ETS for emissions prices, SPM Figure 4 for all gases under New Zealand's EBs (notified or proposed), and SPM Figure 5 for gases excluding biogenic CH_4 under the 2050 target, including the long-term rebound effect for net emissions through 2075 in one scenario.

SPM Figure 6 shows NZ ETS unit prices under alternative NZ ETS pathway scenarios to meet the current net-zero and −20 $MtCO_2e$ targets for gases excluding biogenic CH_4. SPM Figure 7 shows gross emissions under alternative NZ ETS pathway scenarios to meet the current net-zero 2050 target for gases excluding biogenic CH_4.

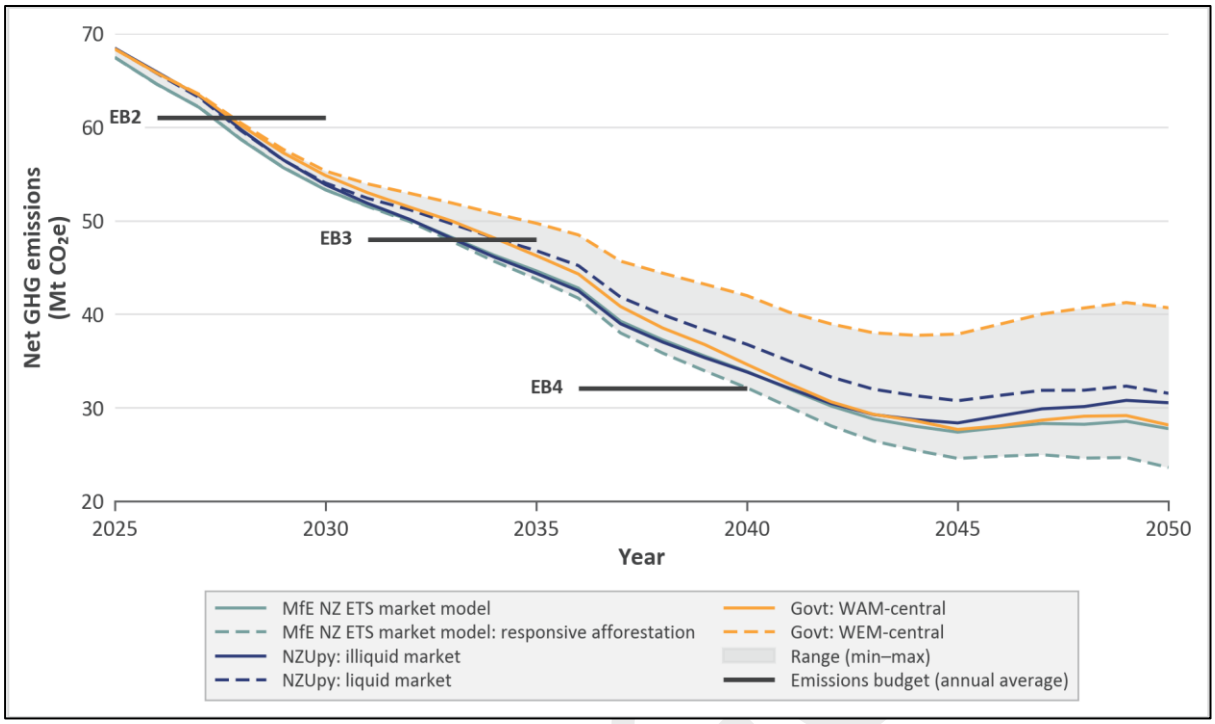
SPM Figure 8 compares afforestation outcomes, and SPM Figure 9 fiscal outcomes, for NZ ETS pathway scenarios to meet 2050 targets of net zero and −20 $MtCO_2e$ for gases excluding biogenic CH_4. Pathway results are simple averages across modelled scenarios.

SPM Figure 10 shows the landowner economic returns for production exotic forest planted at different future years under the modelled RIM, and two scenarios for the status quo NZ ETS, for 2030 to 2050. SPM Figures 11 and 12 show the landowner economic returns for indigenous reversion/regeneration and indigenous direct planting (respectively) in 2030, 2035, and 2040 under different policy options.

SPM Figure 3: NZ ETS emissions price (real 2025 NZD) under status quo policy settings from a range of models and reports, 2025–2060

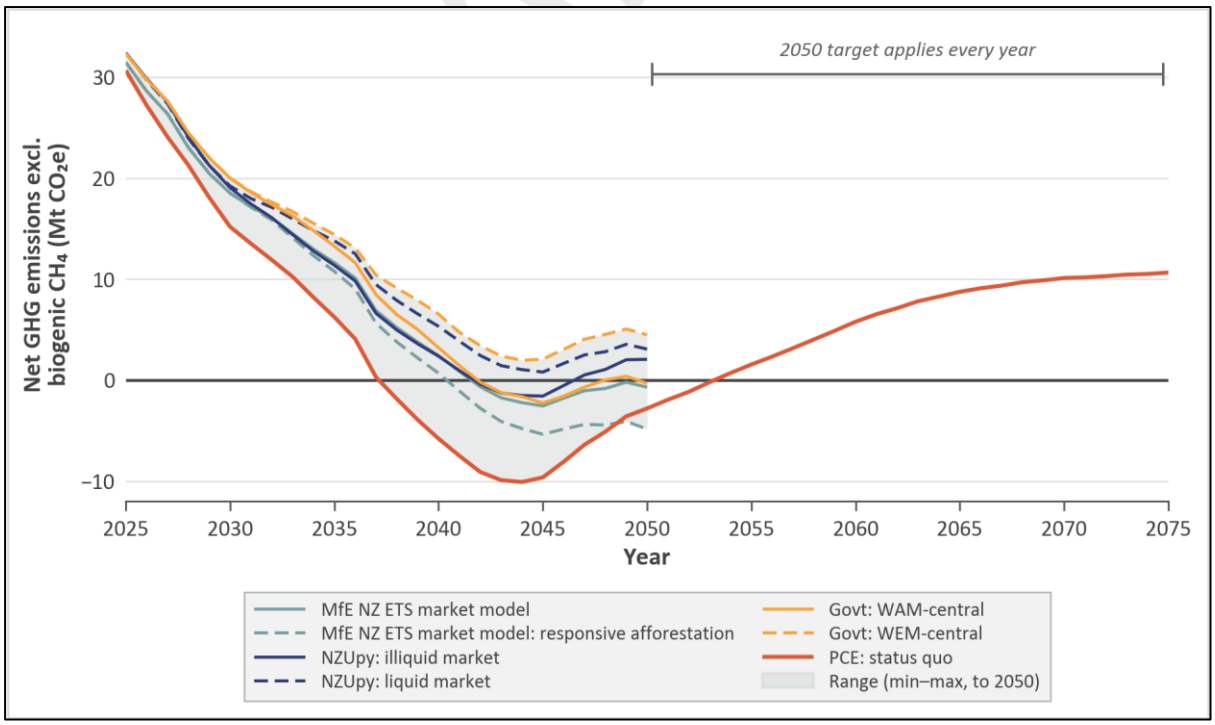


SPM Figure 4: Net GHG emissions ($MtCO_2e$) under EBs using target accounting in a selection of status quo scenarios, 2025–2050



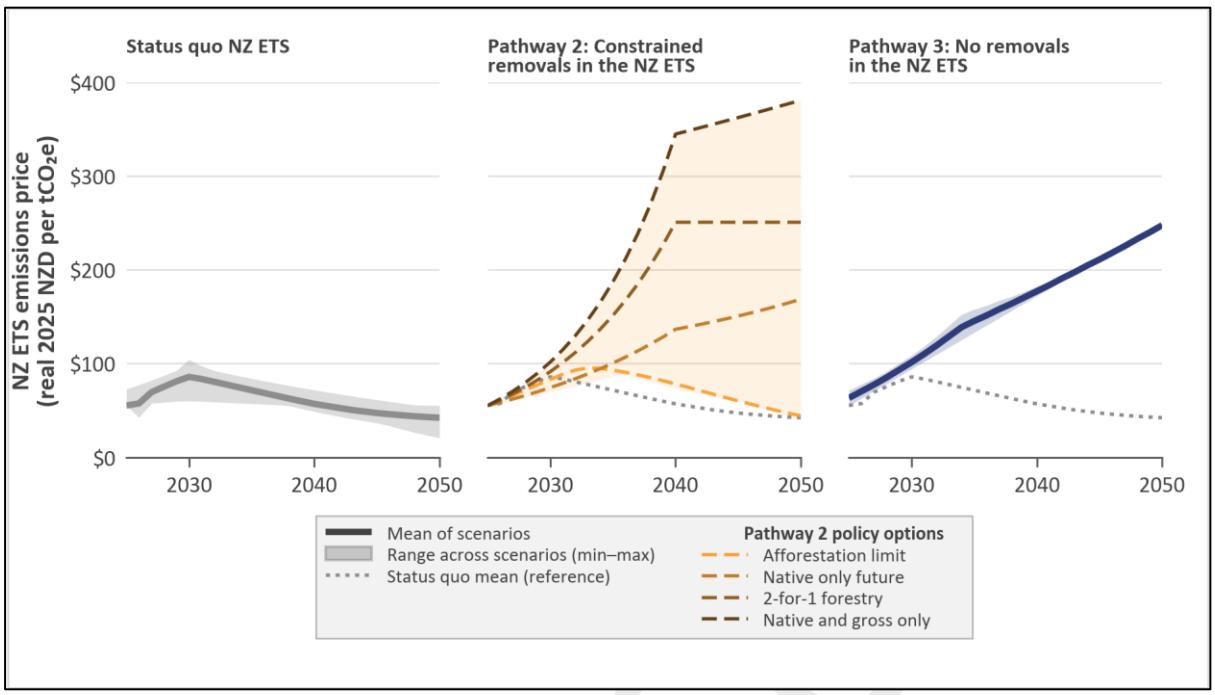
Notes: Govt: WAM-central and Govt: WEM-central are the Government's central projections with additional measures and with existing measures, respectively. NZUpy and MfE NZ ETS market model scenarios use Govt: WAM-central for emissions outside the NZ ETS. EB4 is as recommended by the Climate Change Commission in 2024, not Government policy. Y-axis minimum set to 20 $MtCO_2e$ for clearer distinction between scenarios.

SPM Figure 5: Net GHG emissions excluding biogenic CH_4 ($MtCO_2e$) under the 2050 target using target accounting in a selection of scenarios for the status quo, 2025–2075

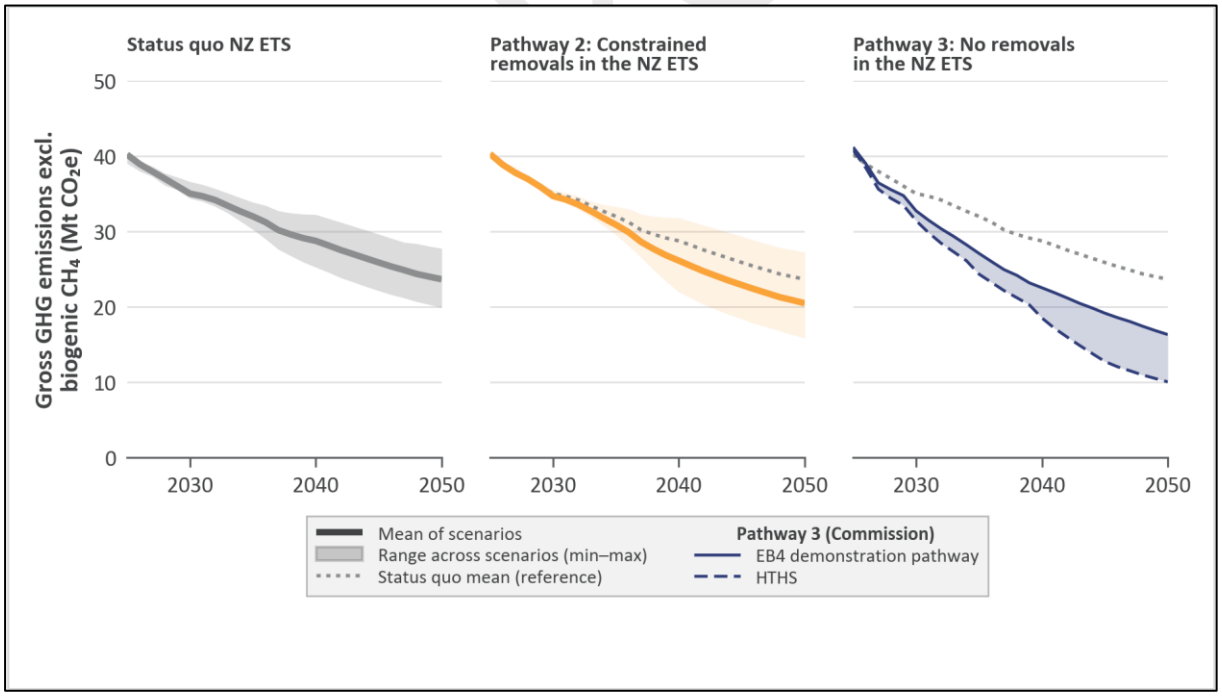


Note: Govt: WAM-central and Govt: WEM-central are the Government's central projections with additional measures and with existing measures, respectively. NZUpy and MfE NZ ETS market model scenarios use Govt: WAM-central for emissions outside the NZ ETS. The range is shown to 2050; PCE: status quo is shown to 2075.

SPM Figure 6: Emissions prices (real 2025 NZD per tCO_2e) under NZ ETS pathway scenarios to meet the current net-zero and −20 $MtCO_2e$ 2050 targets for gases excluding biogenic CH_4, 2025–2050

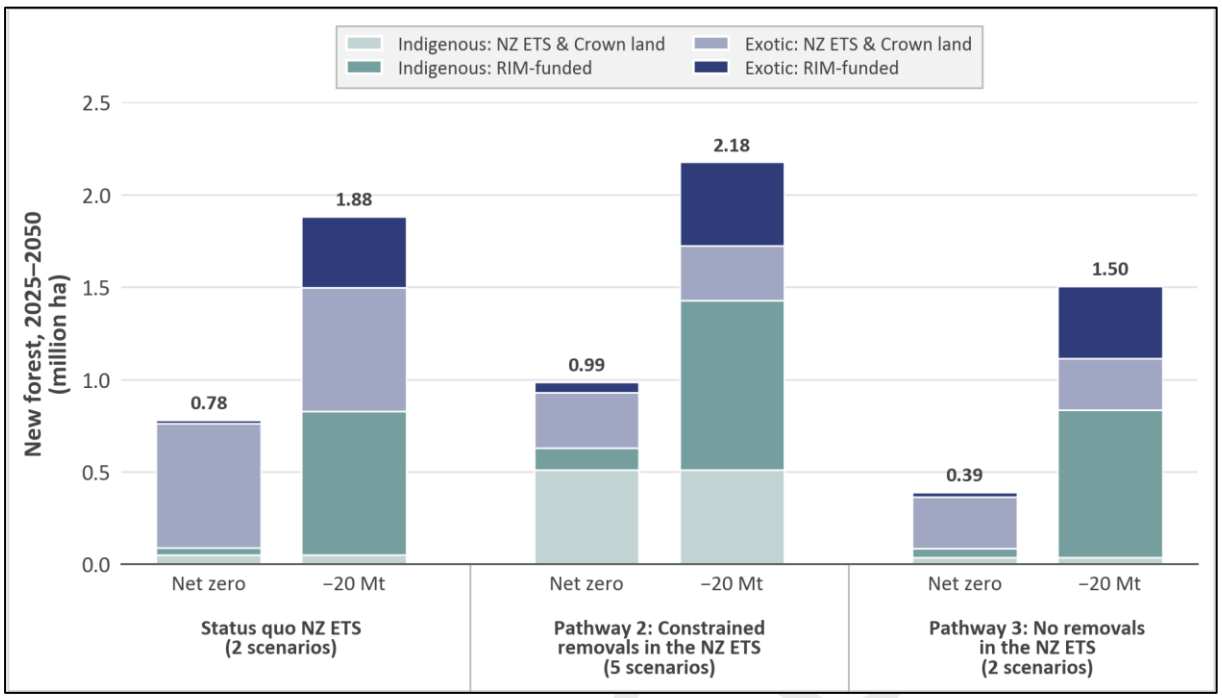


SPM Figure 7: Gross emissions ($MtCO_2e$) under NZ ETS pathway scenarios to meet the current net-zero 2050 target for gases excluding biogenic CH_4, 2025–2050



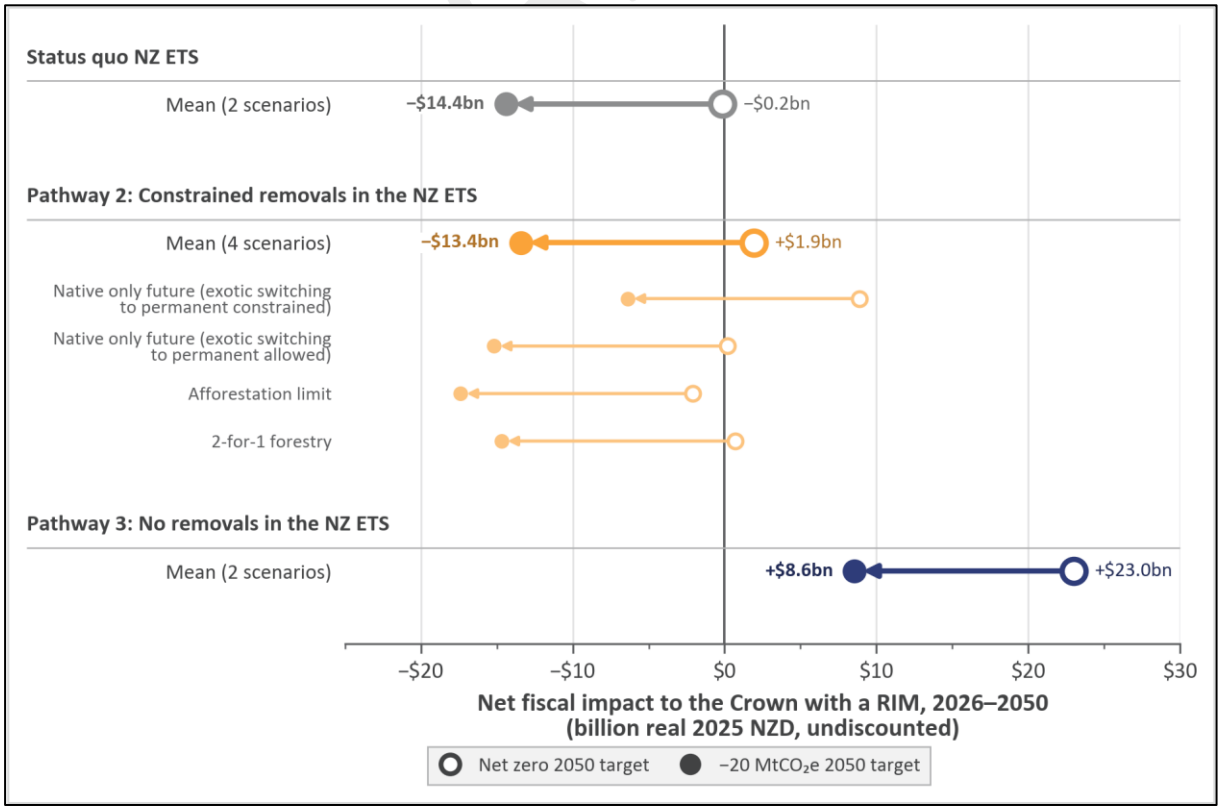
Notes: The HTHS pathway scenario is consistent with meeting a −20 $MtCO_2e$ 2050 target as recommended by the Climate Change Commission. The status quo mean averages NZUpy: illiquid market and PCE: status quo, and the shaded range covers the seven status quo scenarios in SPM Figure 5. The Pathway 2 mean is a simple average of six scenarios (four from PCE and two from NZUpy), so differences relative to the status quo mean partly reflect model differences rather than policy effects.

SPM Figure 8: Afforestation under NZ ETS pathway scenarios with a RIM to meet the current net-zero 2050 target and −20 $MtCO_2e$ 2050 target for gases excluding biogenic CH_4, 2025–2050 (million ha)

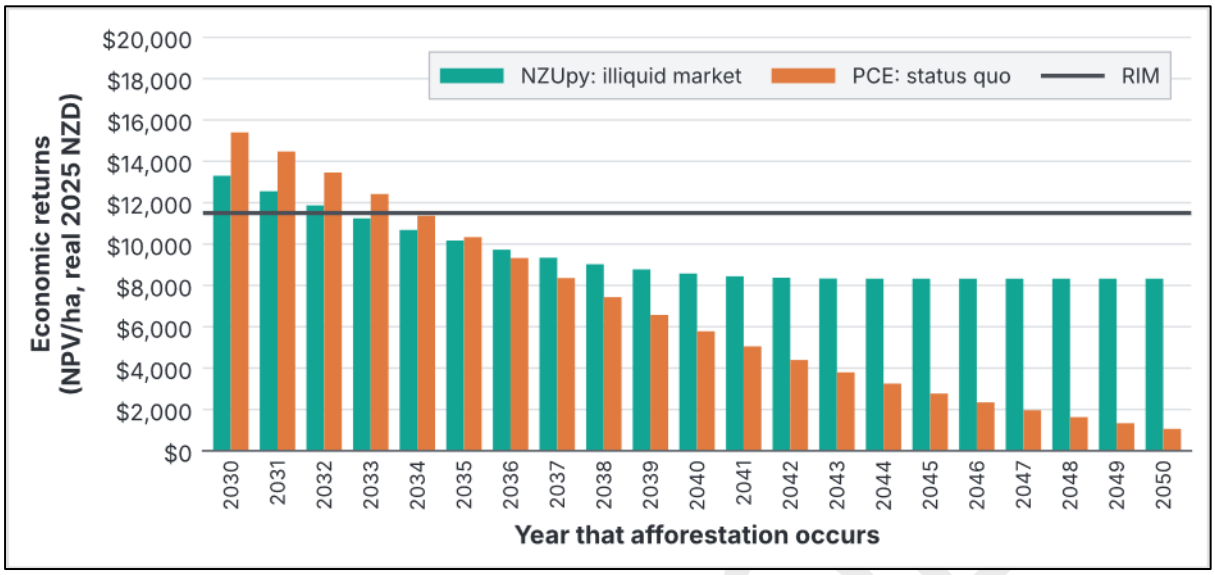


Note: Areas are totals across the NZ ETS, Crown land, and the RIM, and do not consider whether these rates of afforestation could be achieved in practice. Reaching −20 $MtCO_2e$ implies average afforestation of around 72,000 ha/yr for 26 years under the status quo, and around 96,000 ha/yr in the highest Pathway 2 scenario, and so may be unrealistic in practice.

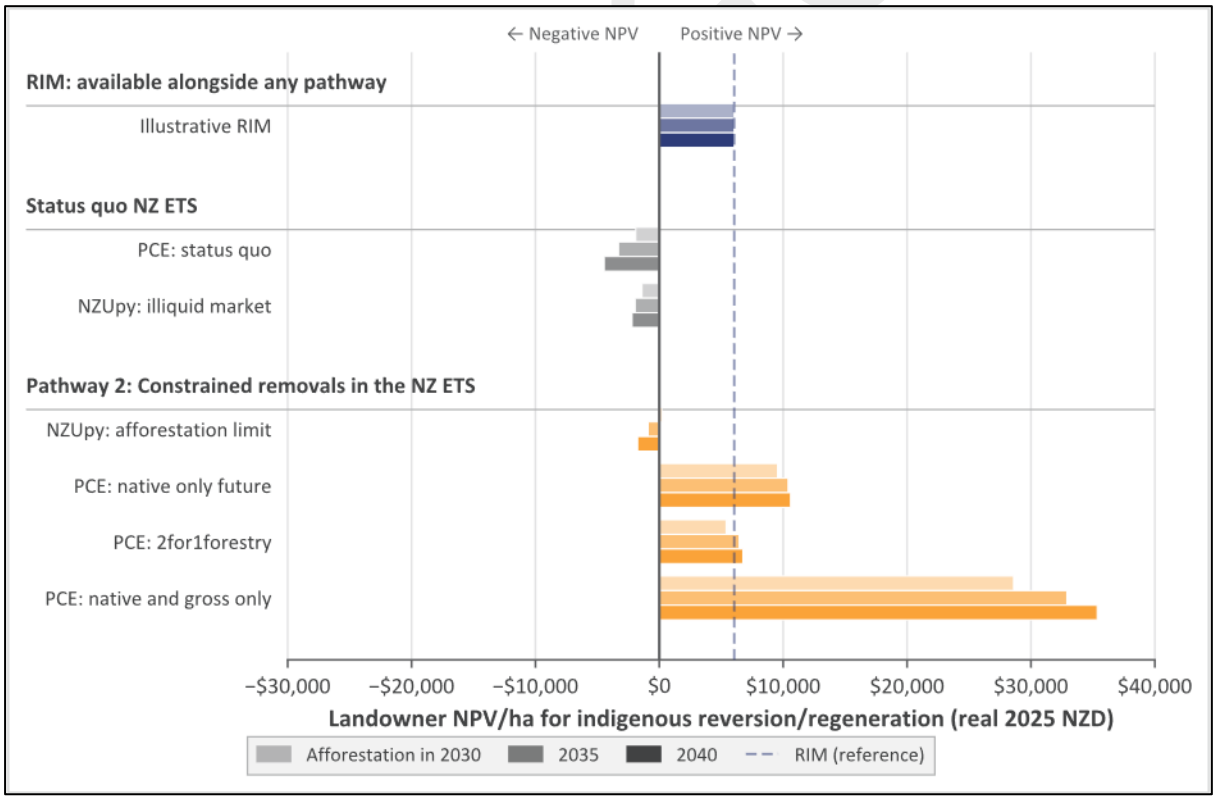
SPM Figure 9: Fiscal outcomes under NZ ETS pathway scenarios with a RIM to meet the current net-zero and −20 $MtCO_2e$ 2050 targets for gases excluding biogenic CH_4, 2026–2050 (billion real 2025 NZD, undiscounted)



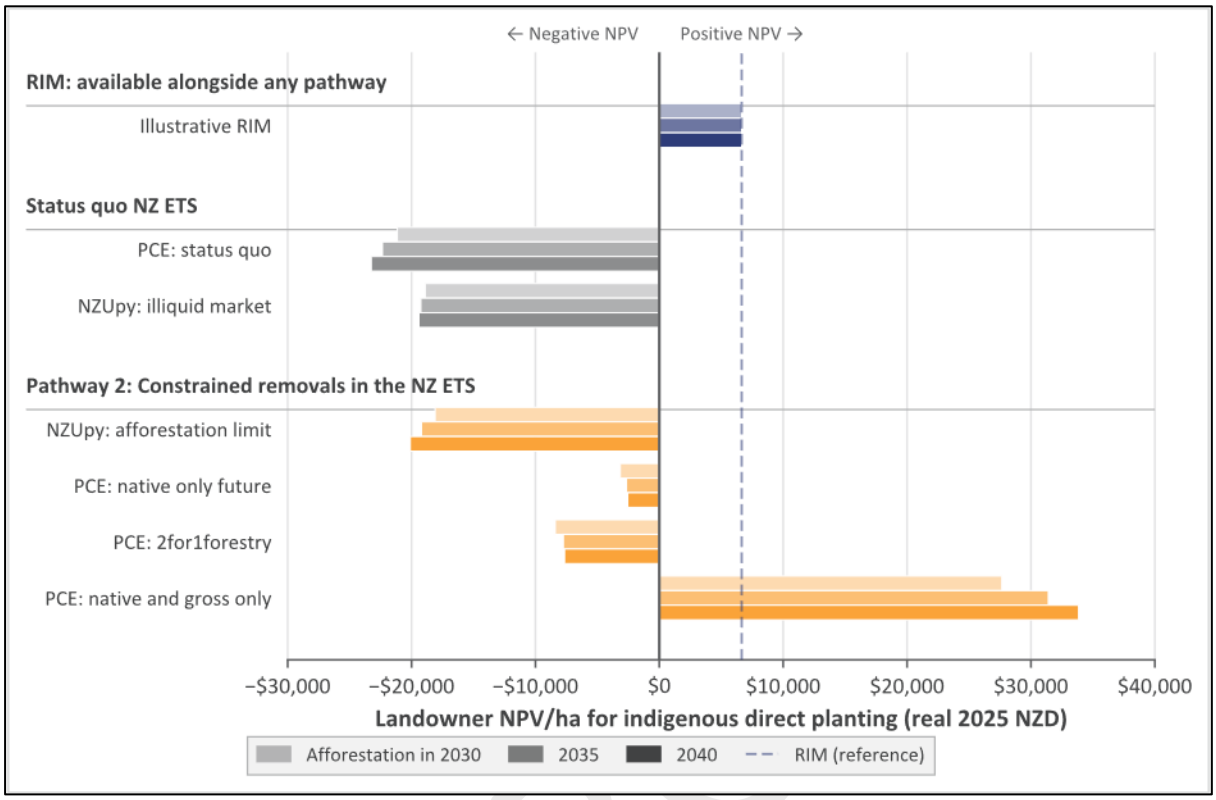
SPM Figure 10: Landowner economic returns (NPV/ha, real 2025 NZD) for production exotic forest planted at different future years under the modelled RIM and two scenarios for the status quo NZ ETS, 2030–2050



SPM Figure 11: Landowner economic returns (NPV/ha, real 2025 NZD) for indigenous reversion/regeneration in 2030, 2035, and 2040 under different policy options



SPM Figure 12: Landowner economic returns (NPV/ha, real 2025 NZD) for indigenous direct planting in 2030, 2035, and 2040 under different policy options



Modelling limitations for the illustrative RIM

SPM Box 2 summarises modelling limitations that affect the costing of an illustrative RIM.

SPM Box 2: Limitations of the costing of an illustrative RIM

1. Payment rates are calibrated so that each forest type is viable from the landowner's perspective. The costing therefore shows what the assumed level of afforestation would cost if delivered but does not consider whether the payment rates assumed are sufficient to guarantee adequate interest and uptake.
2. Additional potential funding streams for the RIM (e.g. enhancement of carbon stores in existing forests) are not costed.
3. Any increase to New Zealand's yield tables due to the RIM, for example increases to the post-1989 natural forest yield table due to a higher predominance of forests with tall indigenous species, is not captured. This reflects the difficulty of forming assumptions for how these yield tables may change over time as a result of a differing mix of afforestation incentivised.
4. No cost is attached to reversals or loss of carbon in RIM-funded forests. The design of mechanisms to deal with reversals is left to a future policy process, and the cost of any such mechanism may be additional to the estimates presented here.

5. For the transfer of existing forests from the NZ ETS to the RIM (under the shift to a gross-emissions ETS), the registered forest area is held constant. In practice, some forests may deregister at the point of transfer, so the long-term costs for payments to existing NZ ETS forests moved to a RIM are indicative of scale rather than a forecast.
6. No learning-by-doing effects are assumed for indigenous afforestation costs. In practice, a sustained level of funding for indigenous afforestation may help to reduce costs over time, whereby seedling nurseries are able to rely on more consistent ongoing demand for indigenous seedling varieties to reduce costs per seedling. Learning-by-doing effects could be enhanced through funding alongside the RIM targeting improvements to nursery capacity, genetics research, and workforce training, as was seen with the 1 Billion Trees' partnership fund. Such funding is not considered in this paper.
7. In practice, the Government could consider enabling more complex funding arrangements linked to carbon or nature markets, placing obligations on certain sectors to pay for some of the removals delivered, or co-funding with councils. These are not considered further given the wide range of permutations as to how the Government could seek to encourage supplementary investment, and given that the primary focus of this paper is to provide an illustrative costing of different future scenarios for the NZ ETS.
8. Administration costs for the RIM will depend on the specifics of its design and the extent to which it relies on existing NZ ETS forestry administrative processes, and so may vary substantially from the estimates provided in the Motu Working Paper.

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