Note: the emissions reduction plan (the Plan) was published in May 2022 and this RIS was developed before its publication. Since May 2022 work has already progressed in a number of areas discussed in the RIS. For up to date information please visit the Ministry for the Environment website www.environment.govt.nz

Regulatory Impact Statement - Transition pathway for the Emissions Reduction Plan

Purpose

The Government must produce New Zealand's first emissions reduction plan (ERP) to meet proposed emissions budgets before 31 May 2022, considering the Climate Change Commission's advice. In this regulatory impact assessment (RIA), we have updated to reflect consultation responses and any other updates and assessed options for overarching strategic approaches or 'transition pathways' that an ERP could take to achieve New Zealand's legislated emission budgets.

Background / Context

The CCRA (Climate Change Response Act) provides a framework for emission reduction and adaptation

The Climate Change Response Act 2002 (the CCRA) provides a framework by which New Zealand can develop and implement clear and stable climate change policies that—

1. contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5˚C above pre-industrial levels
2. allow New Zealand to prepare for, and adapt to, the effects of climate change.

The legislation sets the domestic emissions reduction target for 2050. The 2050 target requires that:

3. net emissions of greenhouse gases, other than biogenic methane, are reduced to zero by 2050
4. emissions of biogenic methane[1] are 10 per cent lower than 2017 levels by 2030, and 24 to 47 per cent lower by 2050.

The CCRA requires emissions budgets and emissions reduction plans

Emissions budgets

An emissions budget is a quantity of emissions that is allowed during a particular period. From 2022 onwards, there must be three emissions budgets in place at any time, providing a pathway to the 2050 target.

New Zealand's emissions budgets will cover 5-year periods[2] and be set 10-15 years in advance, after considering the recommendations of the Climate Change Commission (the Commission). The first three emissions budgets will be set in May 2022, for the periods 2022-2025, 2026-2030 and 2031-2035. These budgets are set in terms of net emissions[3].

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[1] Biogenic methane is defined as methane from the agriculture and waste sectors.

[2] Except that the first emissions budget period is only four years.

[3] Net emissions mean gross emissions minus emissions removals from forestry and other activities.

Emissions reduction plans

Each emissions budget will be supported by an emissions reduction plan (ERP) that contains policies and strategies for meeting the emissions budget. It may also address future emissions budgets that have been notified.

Under the CCRA, the ERP must include:

1. sector-specific policies to reduce emissions and increase removals
2. a multi-sector strategy to meet emissions budgets and improve the ability of those sectors to adapt to the effects of climate change
3. a strategy to mitigate the impacts that reducing emissions and increasing removals will have on employees and employers, regions, iwi and Māori, and wider communities, including the funding for any mitigation action

The CCRA requires the Government to set the first ERP for emissions budget 1 by 31 May 2022. It also sets out consultation requirements and the matters that must be considered by the Commission and the Minister of Climate Change.

The advice of the Commission on emissions budgets and the ERP

The Commission was established to provide independent, evidence-based advice on the actions the Government needs to take to address climate change.

The Commission's final advice was published in May 2021. It included recommended emissions budgets based on extensive analysis and consultation to ensure consistency with meeting the 2050 targets (table 1).

Table 1: the Commission's recommended emissions budgets (Mt CO_2e)

Budget period	2022-2025	2026-2030	2031-2035
All gases, net (AR5)	290	312	253
Annual average	72.4	62.4	50.6

The Commission also provided high-level direction for the ERP for emissions budget 1. This advice must be considered by the Government when preparing its ERP.

The Government has agreed in-principle to broadly accept the Commission's recommended emissions budgets

In August 2021, Cabinet agreed to broadly accept the Commission's recommended emissions budgets, with some modifications for updated forestry projections [CAB-21-MIN-0320.01 refers] (table 2).

Table 2: the Government's proposed emissions budgets (Mt CO2-e) in August 2021

Budget period	2022-2025	2026-2030	2031-2035
All gases, net (AR5)	292	307	242
Annual average	73.0	61.4	48.4

Those proposed emissions budgets broadly accepted the Commission's recommendations, with modifications to take account of new information that had caused projected forestry emissions to change. The revised projections were based on the new forestry intentions survey. This information was not available to the Commission when it reported in May 2021.

There was an error in how this information was interpreted and reported to Cabinet at the time. Increased emissions in the first budget period 2022-2025 were attributed to emissions generated in the early stages of planting forests, when in fact the increase in projected emissions was due to revised estimates of deforestation intentions.

The underlying rationale for adjusting our emissions budgets to take account of the new forestry information from external sources is still valid. However, there is a risk that this presents as a 'relaxing' of the emissions budgets to take account of unhelpful deforestation as opposed to desirable afforestation.

The Minister of Climate Change has proposed to further modify the proposed emissions budgets from last August to not make any allowance for the additional deforestation.

The Minister of Climate Change's new proposal [currently before Cabinet] would mean that the emissions budgets for the first period would now return to 290 $MtCO_2$-e[1]. This is the same level as what was originally recommended by the Commission, requiring a further 2 $MtCO_2$-e of abatement.

The Minister has also proposed to make further changes to emissions budgets for the second and third periods (2026-2030 and 2031-2035), to remove an allowance for 2 Mt CO_2 of deforestation. This is a trade-off between logical consistency in our approach across all emissions budget periods, and a recognition that the second and third emissions budgets are both much lower and further out in the future. There is also lower reliability of projections for outyears based solely on the currently stated forestry intentions.

Table 3: the Minister of Climate Change's proposed emissions budgets (Mt CO2-e) in April 2022 (as at lodgement for Cabinet consideration of the final ERP)

Budget period	2022-2025	2026-2030	2031-2035
All gases, net (AR5) [4]	290 MtCO2-e	305 MtCO2-e[5]	240 MtCO2-e
Annual average	72.4	61	48

This decision will set emissions reductions out to 2035 and, if met, would put New Zealand on track to meet the legislated 2050 target.

The CCRA also requires the Commission and the Minister to have particular regard to the principal risks and uncertainties for emissions reductions and removals when considering how the emissions budgets may realistically be met.[6]

Since August, Ministers and officials have made considerable progress in identifying additional measures and increasing the estimated impacts of policies. We are now much more confident that the policies and measures have the potential to achieve the reductions required in the first budget period. These provide the base for the transition to a low emissions economy.

However, there are still a number of critical assumptions built into this assessment and some significant risks that we will have to actively manage as we implement the emissions reduction plan. The implication is that the sufficiency of the policies and measures in the emissions reduction plan to achieve emissions budget cannot be fully determined in advance [CAB-21-MIN-0320.01 refer].

Our estimates of current and future emissions are based on our best understanding of our future emissions levels, including the future impact of quantified policies and measures that make up the first emissions reduction plan. They are, however, subject to a high level of uncertainty relative to the emissions reductions aiming to be achieved to meet emissions budgets.

This uncertainty can have implications for achieving emissions budgets, particularly if the estimates are significantly different. As a result, achieving emissions budgets may become significantly more or less difficult to achieve than is currently understood. This is not a flaw of the analysis, but a reality that it is important to be transparent about and understand the impacts of uncertainty. As we learn more, we will incorporate this new information into our regularly updated emissions estimates. There will continue to be new information and revised assessments to consider.

Final decisions on setting emissions budgets rest with the Minister under the CCRA. The Minister of Climate Change is required to issue a formal response to the Commission's recommended emissions budgets and a number of specific related recommendations. This includes an explanation of the reasons for any departure from the Commission's advice.

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[4] Expressed using GWP_{100} values from the IPCC's Fifth Assessment Report (AR5) for consistency with international obligations relating to Inventory reporting.

[5] Emissions budget 2 is larger than emissions budget 1 because it covers five years instead of four

[6] Climate Change Response Act 2002, section 5ZC(2)(a)(ii)

Setting emissions budgets will have direct implications on the NZ ETS cap and unit supply volumes. The Climate Change Commission will make recommendations on the ETS cap, auction volumes and auction price control settings following the publication of these budgets and the ERP.

The Minister's final response to the Commission will be a much shorter document than the emissions reduction plan, but will be subject to close scrutiny – including by the Commission and by select committee.

The ERP and other climate change objectives

New Zealand's transition pathway will support the Government's other climate change objectives, including adaptation. Policies implemented through the ERP could help build resilience to climate change risks across different sectors of the economy. There will also be opportunities to align the ERP and New Zealand's National Adaptation Plan.

Climate emergency

The Government declared a climate change emergency on 2 December 2020, with the Cabinet Business Committee agreeing that climate change is "an emergency that has a level of equivalence to a Civil Defence emergency and demands a sufficiently ambitious, urgent, and coordinated response across government to meet the scale and complexity of the challenge" [CBC-20-MIN-0097 refers] This declaration supports taking ambitious action through the first ERP to reduce emissions and achieve budgets.

Nationally Determined Contributions

Under the Paris Agreement, each country adopts an international emissions reduction target known as a Nationally Determined Contribution (NDC). An NDC is a commitment to reduce global emissions over a given period and must represent our highest ambition for contributing to efforts to reduce global emissions. The NDC can be met through a combination of domestic emissions reductions, removals from forestry, and offshore mitigation with environmental integrity under Article 6 of the Paris Agreement.

New Zealand recently announced an updated NDC to reduce net emissions by 50 per cent below gross 2005 levels by 2030.

Reducing domestic emissions and transitioning the economy are the focus of the 2050 targets, emissions budgets, and ERP. Abatement achieved through the ERP will contribute to meeting New Zealand's NDC.

Existing emissions reduction policies in New Zealand

Since 2008 New Zealand's climate change policy has been based around the NZ ETS (Emissions Trading Scheme) to achieve emissions reductions and meet international emissions reduction targets at least economic cost[7]. This has resulted in targets being met primarily through net emissions removals from forests. There was also a focus on

[7] New Zealand had a 2012 target under the first commitment period of the Kyoto Protocol and a 2020 target under the United Nation Framework Convention on Climate Change.

using offshore mitigation to meet the gap between net emissions and New Zealand's international targets.[8]

Several complementary policies have also been adopted, aimed primarily at removing non-price barriers to greater use of renewable energy and improved energy efficiency.

As a result of these policies, New Zealand's net and gross emissions have continued to increase since 1990. The increase in net emissions was primarily driven by the underlying increase in gross emissions, which in turn was driven by underlying growth in population and economic activity despite gradual improvements in emissions intensity.[9]

Table 3 provides information on some of New Zealand's current and historic emissions reduction measures. The Fourth Biennial Report provides more detail on the policies to support New Zealand's transition and climate change efforts.[10]

Table 3: current and existing emissions reduction policies

Policy	Description
New Zealand Emissions Trading Scheme (NZ ETS)	The NZ ETS places a price on gross emissions and rewards emissions removals. Mandatory participants must surrender emissions units (New Zealand Units (NZUs)) to the Crown annually. Landowners can register forested land established from 1990 and earn NZUs. The policy covers all sectors of the economy and about 50 per cent of New Zealand's emissions.
Synthetic Greenhouse Gas Levy (SGG levy)	A levy is used to set an emissions price for synthetic greenhouse gases (SGGs) in imported goods and vehicles, rather than having an obligation under the NZ ETS.
Permanent forestry sink initiative (PFSI)	The PFSI promoted the establishment of permanent forests on land that was unforested. Forests in the programme earned emissions units for the carbon that was sequestered. The PFSI will be replaced by a new permanent forestry activity in the NZ ETS from January 2023.
One Billion Trees fund (replaced the Afforestation grant scheme)	Provided funding to landowners to establish new exotic and native forests. Applications for funding under the One Billion Tree programme have been closed since 2019.

The 2020 amendments to the CCRA, which provided for emissions budgets and ERPs, were designed to provide a framework for New Zealand to develop and implement clear and stable climate change policies. The ERP will provide this framework, but it needs to be underpinned by a transition strategy to inform policy development. Existing policy settings have not been informed by a clear, economy-wide strategy aligned with meeting climate targets and supporting a just and equitable transition.

Cabinet decisions since interim RIA

[8] New Zealand's gross emissions 2013-2020 period are projected to be 642 million tonnes carbon dioxide equivalent (Mt CO2-e), which exceeds the carbon budget available. New Zealand met its unconditional 2020 emissions reduction target by using 109.2 million units from forestry activities and 23.1 million units carried over from the first commitment period (CP1).

[9] Between 1990 and 2019, gross emissions increased by 26 percent (17.2 Mt CO_2-e), while net emissions increased by 34 percent (13.8 Mt CO_2-e) over the same period (see the 2019 Inventory [LINK])

[10] New Zealand's Fourth Biennial Report

On 7 March, Cabinet agreed in principle to establish a new domestic monitoring and reporting system to support the implementation of the emissions reduction plan, subject to funding approval through Budget 2022 [CAB-22-MIN-0055.01 refers].

Cabinet also directed the Minister of Climate Change to report to Cabinet in April 2022 with a proposal outlining the reporting requirements, to be included in the emissions reduction plan.

Further decisions are discussed in detail under the Governance, monitoring, and review arrangements section.

Developing a National Adaptation Plan (the Plan) is required under section 5ZS of the Climate Change Response Act (the Act). The Plan must set out the Government's response to the National Climate Change Risk Assessment (the Risk Assessment). The Plan must respond to the Risk Assessment's most significant risks, but there is considerable discretion on whether and how to address the other priority risks.

The Minister of Climate Change is seeking agreement to the scope and approach for delivering the National Adaptation Plan, including lead agencies for developing and implementing action plans.

The paper also seeks in-principle agreement to the strategic direction to guide and support the delivery of the National Adaptation Plan by August 2022.

The problem definition

New Zealand is not on track to meet the 2050 target

The Commission's analysis found that current policies do not put New Zealand on track to meet the 2050 target. Accordingly, it recommended setting a pathway for longer-term action and laying a foundation to deliver deeper and lasting gross emissions reductions. The Commission's advice highlighted the government's short-term focus of using forestry removals and offshore mitigation, rather than gross emissions reductions, has meant the New Zealand economy has delayed decarbonisation.

While long-lived gross emissions and biogenic methane are projected to fall under current policies, the decrease will not be sufficient to meet the 2050 targets. Net emissions are projected to fall by 2050 under current settings – mostly from emissions removals from 1.1 million hectares of new exotic forests driven by the NZ ETS. Gross emissions reductions are achieved in some sectors (for example in transport where greater uptake of electric vehicles occurs) but are largely unchanged in others (energy, industry, waste, and agriculture).

Unconstrained forestry would limit gross emissions reductions

The Commission found that unconstrained forestry would limit gross emissions reductions to the 2050 targets and undermines decarbonisation of New Zealand's economy. At a moderate emissions price ($35-50 per tonne of carbon), the NZ ETS would drive significant exotic afforestation (1.5 million hectares by 2050). The removals generated by these new forests will allow gross emitters to offset their emissions at relatively low-cost. There will not be a sufficient incentive for more expensive gross emissions reductions.

To maintain net zero emissions from 2050, significant additional planting would be required. Without this, net emissions will increase again as the temporary exotic forestry sink declines. Increased forest planting will also have significant unintended consequences on rural communities and regions.

Decarbonising our economy is important if Aotearoa is to keep pace with – and seize the market opportunities from – the global technology transition in energy, transport, and industry. Emissions reductions are also critical if we are to avoid shifting this responsibility to our children and future generations, and the ongoing need for land to be converted into forestry in the future to maintain net-zero emissions.

s 9(2)(f)(iv)

Current policies are insufficient to meet the Commission's first recommended emissions budget

New Zealand is also not on track to meet emission budget 1. Under current policies, the shortfall between projected emissions and meeting emissions budget 1 is 10.2 Mt CO_2e. The transition pathway adopted for the ERP should support sufficient levels of abatement to address the shortfall. This includes greater short-term reductions in gross emissions given that new afforestation cannot deliver immediate net emissions removals.

Decisions are needed now on the transition pathway to inform the policy mix for the ERP

Decisions are needed now on the high-level strategy for the first ERP. The transition pathway should deliver an appropriate balance of gross and net emissions reductions to put New Zealand on track to meet the 2050 targets. A high-level transition strategy will provide direction to further decisions the Government will take in early 2022 on the policy mix of the ERP and inform where investments to drive emissions reductions should be made.

Larger and more rapid gross emissions reductions are required from all sectors of the economy. While net emissions removals are still required to meet short-term emissions budgets and the 2050 targets, unconstrained forestry removals, which will occur under the status quo, will discourage gross emissions reductions.

What do stakeholders think?

Public consultation on the ERP was held during October and November 2021. The Ministry for the Environment received 10,050 submissions; 1,259 short form submissions (three online questions), 682 questionnaire responses (114 questions, most responses only included answers to a subset of these), and over 8,109 email submissions, the majority of which were pro-forma submissions from one of four organisations[2].

Form submissions can be summarised as promoting nature-based solutions (e.g., restoring wetlands as a carbon sink), regenerative agriculture, an equitable and Te Tiriti-based transition, and enabling households to reduce their personal emissions through urban design, transport, and energy mode shifts.

Emerging themes from the short form submissions when submitters were asked about the most important things to be considered in the development of the ERP included that the ERP is not ambitious enough and progress has been too slow. There is a perceived lack of urgency in the consultation document. There were high levels of support for the discussion document's proposals, although many wanted targets to go further, sought more detail and wanted more support to implement the plan. There was strong support for an equitable lens across the entire ERP and for specific sectors and policies.

Submitters also pointed to the government's response to the pandemic as an example of how fast the country can mobilise to respond to climate change appropriately. Some submitters spoke about the government's responsibilities in upholding Te Tiriti o Waitangi. These submissions noted that a partnership approach was more than consultation and involved co-designing the response to climate change with iwi and supporting Māori to influence decision-making and scale up Māori-led initiatives. Many submitters, including both Māori and other submitters, emphasised the need for the Government to consider and support a kaupapa Māori approach – which is more holistic – and integrate mātauranga Māori concepts.

Industry submitters largely discussed the challenges they expected from the transition to a low-emissions economy. Commonly referenced challenges included policy uncertainty and regulatory changes, energy security, cost barriers to accessing low-emissions technology, a lack of suitable alternatives to high-emissions technology and the skill-base of the labour market. As such, industry submitters often suggested more support for training staff, tax-incentives for green technology, more investment in research, better information to support decision-making and targeted funding to manage transitions in their area.

Energy security was commonly referenced by industry as a priority for Government action. Many submitters were concerned that the sector would not be able to handle increased demand for electricity, meet renewable generation targets, and provide electricity affordably and reliably to meet industry needs. Some industry submitters, particularly in heavy manufacturing, said that if the cost to decarbonise the energy required for production processes did not fall, their business may no longer be economically viable.

Most industry submitters supported working more closely with Government. Some submitters specifically recommended more targeted or nuanced consultation with

stakeholders, as opposed to more traditional forms of public consultation on technical climate concerns.

Setting a date to end new fossil gas connections in buildings was consulted on. Many submitters supported reducing fossil fuel use in NZ, but noted that this would result in distributional impacts for workers and gas users, and could impact the resilience of NZ's energy network. Consequently, there is an action in the ERP to develop a Gas Transition Plan to reduce use of fossil gas while taking these complex impacts into account.

Submitters also highlighted that there are barriers in the existing regulatory system that make it difficult to reduce embodied carbon and construction waste. Consequently, we have introduced proposals to explore and address barriers that existing regulations pose.

We asked submitters what Government could do to help the building and construction sector reduce emissions from other sectors, such as energy, industry, transport and waste. Submitters highlighted that waste management was a priority, and that Councils wanted greater support as part of the consenting system to set waste reduction requirements. We have included an action in the ERP to explore making waste minimisation or recovery plans a prerequisite for building consent.

The support for nature-based solutions is reflected in the emissions reduction plan with a stand-alone 'working with nature' chapter and amendments to the guiding principles/criteria for this RIS and the ERP. Several nature-based solutions proposed by submitters align with actions in the ERP chapter including reporting on biodiversity outcomes as part of the ERP, investigating incentives for public and private investment in biodiversity and investing in the science of nature-friendly sequestration.

Submitters on the consultation document were asked to identify the opportunities and impacts of emission reduction policies. Submitters discussed the biggest impacts of the ERP being: to create a better world for future generations; slowing the frequency of natural disasters; and more generally keeping the planet to a liveable temperature and human survival. Submitters were also keen to see the development of green infrastructure and the creation of jobs in new industries. Some spoke about creating a more equitable economy through fairer tax systems and measuring success in more holistic ways than just Gross Domestic Product (GDP).

There was overall support for a principled approach to the ERP (89% of the 275 responses). Of those submissions that disagreed with a principle the most common was the wording of principle 5, specifically the word "affordability". People raised the idea that the long-term cost of inaction could result in higher overall cost. The sentiment was that affordability and ambition conflicted.

Most submitters agreed that the treatment of forestry in NZ ETS should not delay or limit gross emissions reductions in other sectors (94% of 143 responses). Submitters said more is needed to be done to reduce gross emissions. Some submitters regarded the planting and harvesting of exotic forests as not being beneficial to carbon reduction and as an inappropriate substitute for gross emissions reductions.

The consultation submissions support the overall approach to the ERP because the preferred option focuses on a mix of policies to enable gross emissions reductions, an equitable transition, empowering Māori and working with nature. The preferred approach takes a balanced approach to emissions pricing and afforestation rather than relying on these tools (Option 2 and 3 below). Submitters had concerns with reliance

on these two tools due to impacts on the cost of living, biodiversity, and insufficient emissions reductions.

The consultation submissions stressed the importance of nature-based solutions, so we have added this as an additional principle guiding the ERP and created the 'working with nature' ERP chapter to ensure actions to address climate change are aligned with biodiversity objectives.

[2] The Green party, World Wildlife Fund, Forest and Bird, Anglican Movement

Limitations and constraints

The RIA provides high-level, qualitative analysis to draw out the impacts and trade-offs of options for the transition pathway of the ERP. The basis for this analysis is the Commission's final advice and analysis. We have assessed the Commission's advice on emissions budgets and consider it to be rigorous and robust. It is also informed by feedback from public consultation. Where possible, the RIA undertakes additional analysis to confirm and support the Commission's evidence and draws from the recent ERP consultation.

The Commission's role is to provide evidence to the Government to make decisions on the ERP. We therefore consider it appropriate to use for upcoming decisions on the transition pathway. Over time, the Government will add to and improve the Commission's evidence to refine parts of the plan. In the interim, though, decisions are needed on the transition pathway and the RIA cannot redo the comprehensive, whole of economy analysis carried out by the Commission. Substantively repeating the Commission's analysis would be redundant and impossible to do given timing and resourcing constraints.

The economic and fiscal implications of meeting the budgets cannot be readily determined in advance as they will critically depend on the detail of how we meet these budgets – this will be a function of our first emissions reduction plan and subsequent plans, market trends, global events, and a number of other factors both within and outside of the Government's control.

The Cabinet Environment, Energy and Climate Committee directed officials to conduct analysis on the expected distributional impacts of possible high carbon prices in the ETS in 2020, 2025, and 2030 [[ENV-19-0016].

This analysis contained several constraints and limitations, and the analysis will not be updated prior to the lodgement of the final ERP. Indicative findings from the initial analysis are found under the 'Further high-level assessment of the preferred package' on page 25.

As the ERP transition pathway represents the Government's high-level strategic approach to meet emissions budgets, we consider a qualitative analysis, based on the principles for the ERP, will enable Ministers to weigh the impacts of different options. It would be unnecessary to attempt a cost-benefit analysis of high-level decisions. This level of quantification would be undertaken for specific proposals used to implement the ERP transition pathway.

There are uncertainties associated with projected baseline emissions data and the estimated impacts of specific policies on emissions. Government agencies are

continuing to quantify emissions reductions of specific proposals for the ERP. Given this RIA considers the transition pathway of the ERP, and not specific emissions reduction proposals, we do not estimate the impacts on emissions of the different high-level strategic options.

Objectives

The overarching objective is to enable an equitable transition to a low-emissions and climate resilient future.

The Government has the following sub-objectives to enable the transition and address the Commission's advice and recommendations for the first ERP:

1. The transition pathway should put New Zealand on track to achieve the 2050 targets and maintain that abatement beyond 2050
2. The transition pathway should support meeting the first three emissions budgets
3. New Zealand's transition pathway should prioritise urgent and significant gross emissions reductions

We note that Cabinet has already agreed to a similar objective for gross emissions reductions through New Zealand's long-term low emissions development strategy (LT LEDS)[11]. Given the LT LEDS is considered an initial part of the ERP by the Government, this further supports including an objective prioritising gross emissions reductions for the transition pathway.

Climate change adaptation is not an explicit objective for the transition pathway but is considered through one of the guiding ERP principles 'environmental and social benefits beyond emissions reductions

Criteria

Given the range of considerations for the design of the ERP, not all of which can be monetised, assessment criteria have been developed that elaborate on what is required from the transition pathway to achieve the above objectives. These criteria have been developed considering:

1. Section 5ZG of the CCRA[12], which prescribes how emissions budgets must be met
2. The guiding principles for Government decisions on the ERP that were included in the discussion document *Te hau mārohi ki anamata - Transitioning to a low-emissions and climate-resilient future*.[13]
3. The Commission's eight principles underpinning their advice for meeting the 2050 targets, the recommended budgets, and the ERP.[14]
4. Public consultation on the ERP:

[11] Te hau mārohi ki anamata. Transitioning to a low-emissions and climate-resilient future

[12] Link to CCRA

[13] Link to principles

[14] Link to Commission's principles

- Most submitters on the ERP public consultation agreed that the ERP should be guided by a set of principles. Many submitters broadly agreed with all five principles suggested in the discussion document and provided some caveats or amendments. Some submitters suggested additional principles for consideration such as nature-based solutions.
- 'Environmental and social benefits beyond emissions reductions' was one of the five guiding principles proposed in the discussion document. Officials strongly considered feedback on nature-based solutions as a guiding principle for the ERP.
- This principle has since been amended to 'Enhance the role that nature-based solutions play in helping tackle the climate emergency'. This principle requires that the emissions reduction plan's actions will protect, enhance, and restore nature where possible, and any negative impacts on nature should be mitigated as much as possible.
- Cabinet agreed [ENV Sub-Committee, pending Cabinet agreement] "that a guiding principle of the Emissions Reduction Plan (ERP) be that climate mitigation policies, planning and regulation should protect, enhance, and restore nature where possible, and any impacts on nature should be mitigated as much as possible".
- In response to this guiding principle, the Minister of Transport has embedded nature-based solutions as part of the response to reducing transport emissions and improving climate adaptation and biodiversity outcomes.
    - Key initiatives must consider the role that nature-based solutions could play in reducing transport emissions and contributing to other benefits.
    - Transport policy and investment settings must encourage the use of nature-based solutions, including protecting existing carbon sinks and supporting new long-term carbon sequestration opportunities where appropriate.

Table 4 outlines the criteria used in this RIA to assess ERP transition pathway options against the status quo.

Table 4: assessment criteria

Assessment criteria	How this is measured
Effective at achieving emission reductions to meet emissions budgets,	The transition pathway supports New Zealand to meet emissions budget 1 and puts t on track towards meeting the 2050 target and sustaining this beyond 2050

the 2050 target and beyond	
Prioritises gross emission reductions	The transition pathway should achieve material reduction of gross emissions to: 1. Address the current shortfall to meet emissions budget 1 2. Ensure the 2050 target is met The criteria do not preclude a role for net emissions reductions to meet budgets and the 2050 targets. Rather that unconstrained forestry should not prevent gross emissions reductions.
Enables a fair, equitable, and inclusive transition	The transition pathway provides opportunities for affected regions, communities, employees, employers, and iwi and Māori, to reduce emissions in ways that work best for them and minimises the negative impacts, and social and environmental risks, of the transition. This should include avoiding: • exacerbating existing inequities • penalising early movers • compounding historic grievances with iwi/Māori • leaving too much of a burden for future generations • exacerbating environmental issues
Supports an evidence-based approach	The transition pathway and the selection of policies for the ERP are informed by evidence/analysis, drawn from a range of sources including the Climate Change Commission and mātauranga Māori. Decisions use the most up-to-date science and considers domestic context and international commitments.
Environmental and social benefits beyond emissions reductions	The ERP supports a range of environmental and social benefits in addition to reducing emissions. This includes promoting nature-based solutions that sequester carbon, building resilience and adapting to climate change impacts, and supporting biodiversity. New policies and settings should also consider broader social, health, economic, environmental, and cultural impacts and benefits.
Upholding Te Tiriti o Waitangi	The ERP should uphold Te Tiriti o Waitangi by strengthening the Crown's partnership iwi/Māori, applying Māori values and mātauranga Māori to the transition, and ensuring a variety of Māori voices in the design and development of the transition.
Provides a clear, ambitious, and affordable path	The transition pathway should support stable and predictable policies, but also acknowledge uncertainty and allow for policies that can adapt over time.
Enhance the role that nature-based solutions play in helping tackle the climate emergency	The emissions reduction plan's actions will protect, enhance, and restore nature where possible, and any negative impacts on nature should be mitigated as much as possible.

Scope

The decision-making process for the ERP has set the scope for the RIA

Decisions on the ERP have been sought in two tranches. The first tranche was planned for December 2021 but was postponed and lodged for Cabinet in February and March 2022. These papers included options for the Government's transition pathway for the ERP. The purpose of this RIA is to assess different pathway options to support these decisions.

The first tranche also included decisions on:

1. the core ERP policies
2. the transport content of the ERP
3. reducing emissions in the energy, industry, and construction sectors
4. distributional impacts, circular economy and bioeconomy, and research, science, innovation, and technology
5. planning and infrastructure

The other first tranche decisions will be supported by separate RIAs and are therefore out-of-scope of this RIA.

The second tranche in April 2022 will include decisions on setting the first three emissions budgets and the Government's formal response to the Commission's budget advice. It will also finalise in-principle decisions taken through tranche one and seek approval for new proposals that have been included in the ERP. All tranche two decisions are out-of-scope of this RIA.

The full ERP, including all final policy decisions taken in both February and March 2022, will be brought to Cabinet in April 2022 prior to its publication before 31 May 2022.

The RIA does not directly consider policies in the ERP that would support climate change adaptation.

Summary of options

In its advice, the Commission identified emissions reduction opportunities and recommended actions to address emissions across the main emitting sectors (energy, industry, transport, agriculture, forestry, product use and waste). An effective and well-balanced approach to meeting the emissions budgets will mean action is required in every sector.

We have also identified alternative 'high reliance' transition pathways, whereby a particular approach is highly prioritised and relied upon to deliver most of the abatement required, with minimal supporting additional policies.

Considering this, we assess the following options for the ERP transition pathway. These are different packages of strategies and policies with a reliance on a singular tool i.e., emissions pricing or forestry, or a more balanced approach (option 4).

1. Option 1: Status quo – the current mix of policies and settings used in New Zealand to achieve previous targets
2. Option 2: High reliance on emissions pricing
3. Option 3: High reliance on forestry
4. Option 4: Preferred – An integrated package of strategies and policies

We also considered a 'technological optimism' pathway that would rely on the advent of technologies to reduce and remove emissions in the medium to long term. However, as the option cannot be demonstrated to meet the emissions budgets it does not warrant further analysis. This option would be supported by increased funding in research and development of emissions reduction technologies and supporting policies and aligning systems to enable new technologies to be easily adopted by industry as they eventuate. It could also involve the emergence of new carbon capture and storage technologies to replace or supplement forests. Relying on these actions would not enable us to achieve emissions budget 1 and future budgets given the substantive lags in technology development and uptake.

Option 1: Status quo – the current mix of policies and settings used in New Zealand to achieve previous targets

Under the status quo, New Zealand's transition pathway would rely on existing measures, primarily the NZ ETS, to drive net emissions reductions. With no clear strategy underpinning this plan, these policies are unlikely to meet the first three emissions budgets (as agreed in-principle).

Option 2: High reliance on emissions pricing

This pathway represents a high reliance on emissions pricing, primarily through the NZ ETS, to reduce gross emissions and meet budgets. There would be much less use of non-pricing, complementary policies than the Commission proposed in its final advice.

The Commission's modelling of its demonstration pathway suggested that between 20-23 per cent of net emissions reductions would be driven by the NZ ETS. This pathway would need to deliver a much greater portion if budgets are to be met.

Under this option, it has been assumed that several changes are made to the current settings of the NZ ETS. These include:

1. *Limiting removals from exotic forestry*. Without limitations on exotic forestry, a high reliance on emissions pricing would drive net emissions reductions over gross and would be like the high reliance on exotic forestry pathway. The Government could limit exotic forestry by capping the area of land that can be registered in the NZ ETS or introduce measures to manage the supply and demand for forestry units. Some emissions removals would still come from native forests.
2. *Creating an effective emissions cap to constrain the emissions covered by the NZ ETS*. This would require removing the NZ ETS cost containment reserve price control mechanism and not allowing offshore mitigation to be surrendered in the scheme. It would also include stronger measures to reduce the stockpile of units held in private accounts, and/or reducing the volume of units supplied into the NZ ETS market from auctioning.
3. *Ensuring a higher emissions price by removing or adjusting price controls in the NZ ETS*. The emissions price would need to reflect the higher marginal abatement costs required to incentivise gross emissions reductions and overcome non-price barriers to the transition. An emissions price of $575 per tonne of carbon has been estimated to overcome existing barriers to electric vehicle uptake.
4. *Expanding the scope of emissions pricing to cover more sources of gross emissions.* In addition to the NZ ETS, this pathway assumes an emissions pricing is introduced for agriculture emissions. This could be done via the NZ ETS or a separate pricing policy for agricultural emissions.
5. *Reforming industrial allocation in the NZ ETS and removing over-allocation.* Industrial allocation reduces the cost impact of the NZ ETS on emissions intensive and trade exposed industrial firms. While industrial allocation is slowly being phased out, it will need to be rapidly reduced to ensure all emitters face the full cost of their emissions.

The effect of these changes would be that the NZ ETS drives much higher levels of gross emissions and minimal net emissions reductions through exotic forests. However, this approach would likely have substantial economy-wide and employment implications. Emission intensive and trade exposed industries such as agriculture, steel, and cement would be unable to compete with their international counterparts with the additional or new emission costs.

The emissions price in some areas such as private vehicle ownership (above) would need to be excessively high to drive behaviour change and emissions reductions.

While this may enable our emissions budgets to be met, the emission pricing impacts would also be felt on the costs of goods and services across the economy and have high cost of living impacts for all New Zealanders.

Many submitters disagreed with the approach of providing industrial allocations to Emissions-Intensive, Trade-Exposed (EITE) businesses and wanted industrial allocation phased out faster than the existing policy. A few industry submitters had the opposing view, that industrial allocations were still needed to protect manufacturing in Aotearoa. Many individuals also called for agriculture to be brought into the NZ ETS (many submitters appeared unaware of the He Waka Eke Noa process, further covered in section 18, 'Agriculture').

This option is likely to have a detrimental cost to the economy with higher costs of living implications for all New Zealanders. It would be highly likely to exacerbate existing socio-economic inequalities.

Option 3: High reliance on forestry

New Zealand's primary abatement option for addressing climate change has been through forestry removals, primarily incentivised by the NZ ETS. Under this option, New Zealand's transition pathway would prioritise planting new exotic and native forests to decrease net emissions (although in practice, we would expect to see mostly exotic afforestation). This would imply a gross-net balance heavily weighted towards net emissions reductions.

Under this option, there would be no restrictions on the level afforestation, the type of new forests (plantation or permanent, exotic species or native), nor the location of new forests. It is assumed that the NZ ETS settings would continue as per status quo. This means forestry would remain in the NZ ETS and the emissions price would be near the bottom of the NZ ETS price corridor and much lower than the high reliance on emissions pricing pathway.

It is also assumed that an increase in native afforestation would occur similar to that recommended by the Commission. This would require non-NZ ETS incentives to address the high short-term barriers to establishing native forests, such as afforestation grants (like the One Billion Trees fund) or a biodiversity credits/payment policy. However, as the NZ ETS provides stronger incentives for fast-growing exotic species, most of the afforestation realised under this pathway would be exotic.

A high reliance on forestry would not be effective at meeting emissions budget 1 given it takes several years for new forests to sequester material levels of carbon. This pathway would need to be supported by some additional measures to contribute the necessary abatement for emissions budgets one and two. However, under this option New Zealand's transition would generally eschew complementary measures over the longer-term to achieve the 2050 targets.

Within this option, emissions removals from plantation forests would need to increase to offset emissions in the near and long term. The transition pathway would also focus on encouraging native afforestation to provide a long-term carbon sink to offset long-lived and hard to abate emissions. However, this objective could be undermined by the stronger incentives for exotic forestry.

Exotic forests sequester carbon faster and production forests provide more economic benefits from harvested wood products. On the other hand, native forests take longer to become a significant carbon sink but are likely to result in better biodiversity

outcomes, are more resilient to the impacts of climate change, and have greater cultural and aesthetic value.

s 9(2)(f)(iv) [redacted].

The outlined concerns and risks were echoed in submissions on the ERP consultation document.

Almost all submitters agreed that the treatment of forestry in the NZ ETS should not delay or reduce gross emissions reductions in the economy. The main reason was that focusing on net emissions (offsetting via forestry) disincentivised or hindered reducing gross emissions.

Many individuals raised unintended consequences that the Government needed to consider. These included the environmental impacts of monocultural pine plantations such as erosion, biodiversity loss and fire risk. Another common view was that foreign ownership of plantation forestry negatively affected Aotearoa businesses, including construction firms and Māori-owned forestry.

A few submitters commented that the owners of these plantation forests were more likely to export raw logs without considering domestic processing or use. A few organisations suggested the impacts on rural communities should be considered.

On balance, a high reliance on forestry is likely to cost less than Options 1, 2 and 4 and have a lower impact on the cost of living. However, under this approach we are unlikely to meet our emissions reduction targets and increase the cost of transitioning the rest of the economy in future by delaying action.

Option 4: Integrated package of strategies, policies, and measures (preferred)

This option is broadly aligned with the Commission's advice and can be summarised as a pathway that takes a range of actions to achieve emissions budgets. These include actions in several areas such as:

1. Regulation (bans or restrictions on certain emitting products or actions),
2. Emissions pricing (increasing the NZ ETS price corridor and expansion to include agriculture),
3. Managing unit supply and demand in the NZ ETS to support a strong, stable, and escalating emissions price in the future,
4. Incentivising an appropriate level of forestry removals (both exotic and native; production and permanent),
5. Incentivisation (subsidies/taxes),
6. Behaviour change (supporting and encouraging action),
7. Technology and innovation (accelerating development and uptake of mitigation technologies),
8. Prioritising nature-based solutions.

In contrast with options 2-3, an integrated package would not rely on a specific approach to reduce emissions and meet New Zealand’s budgets.

There is a substantive overlap with the other options to capitalise on some of the benefits that each option provides, while minimising and managing the costs and risks.

The key overlap is that the integrated pathway would support gross emissions reductions while maintaining a significant role for forestry removals towards achieving budgets. Gross emissions reductions would be prioritised through changes to some policies and settings – in particular changes to NZ ETS unit supply and forestry settings. The Government is currently progressing changes along these lines, by consulting on proposals to remove permanent exotic forestry from the NZ ETS[15]. Changes to the Resource Management Act and Overseas Investment Act are also under consideration. A wider work programme exists across agencies considering the long-term role of forestry in the NZ ETS and how the policy can support a balance of gross and net emissions reductions.

The transition pathway would focus on greatly encouraging native afforestation to provide a long-term carbon sink to offset long-lived and hard to abate emissions. The balance of gross-net emissions reductions would largely reflect that recommended by the Commission.

Under this pathway, sector specific policies would play a significant role by helping to reduce non-cost barriers that the NZ ETS cannot effectively address at lower prices. This could include complementary measures, such as the electric vehicle feebate scheme to encourage emissions mitigation in transport, the One Billion Trees programme to encourage and fund carbon sequestration from new native forests, and the Government Investment in Decarbonising Industry (GIDI) Fund to support energy efficiency and fuel switching from industry.

Targeted policies and measures can also help to address and manage the distributional impacts arising from the transition. For example, managing forestry in the NZ ETS could help mitigate the socio-economic impacts of exotic afforestation on rural communities.

Lastly, targeted policies can ensure new technologies are available for widespread uptake when needed at lower overall cost. This can be achieved through education and taking advantage of economies of scale.

This integrated pathway intends to align system settings and use cross-sector tools to:

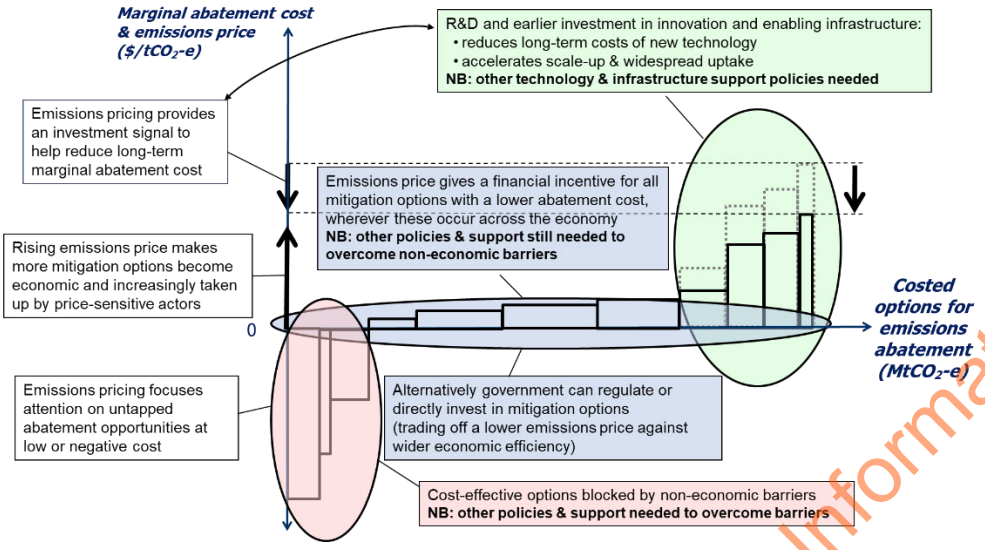
1. ensu e every government decision is consistent with climate goals
2. amend and continuously improve the NZ ETS
3. mobilise public and private finance and the financial system
4. change the way cities and towns are planned and designed
5. drive low-emission innovation and uptake
6. make it easier for people to make low-emissions choices
7. move to a circular economy and develop the bioeconomy

Figure 1 shows the interaction between emissions pricing and other policies in an integrated pathway to achieve the low emissions transition at a manageable cost to the economy.

[15] Managing exotic afforestation incentives: Proposals to change forestry settings in the NZ Emissions Trading Scheme

Figure 1: interaction of emissions pricing and other mitigation policies

How pricing emissions supports the low emissions transition at manageable cost to the economy



High level assessment of options against objectives

Table 5: Impact analysis of transition pathway options for the ERP

	Status quo – existing policies and settings	Option 2: High reliance on emissions pricing	Option 3: High reliance on forestry	Option 4: Integrated package of strategies and policies
Effective at achieving emission reductions to meet emissions budgets, the 2050 target and beyond	New Zealand is not on track to meet emissions budgets or the 2050 target.	Uncertain whether emissions budget 1 would be met as it depends on how quickly changes to the NZ ETS can be made to incentivise emission reductions + Will meet the 2050 target and sustain this as high emissions price will drive emissions to zero	Would not achieve emissions budgets 1 and 2 without support policies that reduce gross emissions + 2050 target may be met - 2050 target may not be maintained without ongoing conversion of farmland to forestry	++ Effective at meeting budgets, the 2050 targets, and will enable NZ to maintain net zero beyond 2050
Prioritises gross emission reductions	No prioritisation of gross emission reductions, likely to encourage more afforestation planting	++ High reliance on emissions pricing, combined with limits on forestry, would drive significant gross emissions reductions - Limitations on exotic afforestation would reduce net emissions reductions needed to meet near-term emissions budgets	Same as the status quo. Relies on forestry removals with little focus on gross emissions reductions. s 9(2)(g)(i)	++ A range of measures that focus on reducing gross emissions + Supports the Commission's recommended balance of gross and net emissions reductions
Enables a fair, equitable and inclusive transition	Unlikely to transition the economy and likely to lead to ad hoc interventions to address inequalities	- Prohibitive cost to the economy. Higher emissions costs passed through commodities and services ikely to have significant impacts on households, businesses, and	- Intergenerational inequity as high reliance on forestry would delay decarbonising the economy, passing the cost of reducing emissions to future generations +	++ Spreads the impact and supports decarbonisation actions, while removing barriers to emissions reductions to reduce overall costs

	Status quo – existing policies and settings	Option 2: High reliance on emissions pricing	Option 3: High reliance on forestry	Option 4: Integrated package of strategies and policies
		Māori; likely to exacerbate inequalities	Least-cost abatement from forestry would reduce the socio-economic impact of the transition on vulnerable groups and communities - High levels of exotic afforestation could create negative distributional impacts on rural communities	
Ensure emissions cuts align with the science	Pathway does not incorporate evidence/analysis and is not consistent with the Commission's advice	- Not consistent with the Commission's advice or analysis - Evidence in NZ shows that businesses would likely be required to reduce production to reduce emissions as there are few opportunities to quickly shift to low emissions alternatives	- Not consistent with the Commission's advice or analysis - Risk in this approach as forests are not permanent, they are vulnerable to pests, disease, and extreme events - There is also some scientific evidence that the atmospheric effect of removals is not fully equivalent to reductions[16]	++ Largely consistent with the Commission's advice and analysis + An integrated package including implementing a combination of emissions pricing, targeted sectoral policies, and support for innovation and infrastructure is supported by international studies (OECD[17], World Bank[18])
Enhance the role that nature-based solutions play in helping tackle the climate emergency	No consideration of other benefits	Same as status quo	+ Substantial afforestation could support a range of environmental benefits (product substitution, biomass availability, biodiversity, erosion control etc.), although benefits dependent on types and locations of forests that are established	++ Consideration of co-benefits of policies as part of their development such as the health benefits from less fossil pollution from vehicles. Increased afforestation would also have range of benefits (as per option 3) ++ Provides for targeted policies and measures to better manage distributional impacts of the transition

[16] IPCC AR6 Technical Working Group 1 report and IPCC Special Report Emissions Scenarios.

[17] OECD link to be added

[18] World Bank link to be added

	Status quo – existing policies and settings	Option 2: High reliance on emissions pricing	Option 3: High reliance on forestry	Option 4: Integrated package of strategies and policies
Upholding Te Tiriti o Waitangi	Unlikely to significantly reduce emissions and increases the vulnerability of Māori to climate change impacts	- Limits on exotic forestry would disproportionately impact Māori landowners and is inconsistent with Government objectives to support the development of Māori economy	+ High reliance on forestry could address some barriers to the development of Māori-owned land + Native afforestation would increase the ability of Māori to practice kaitiakitanga - Liabilities imposed on changing land use from forestry could constrain the options for Māori land development - High rates of exotic afforestation could increase risks to native biodiversity (taonga)	+ An integrated package is likely to consider Māori society much more comprehensively, distributing the costs and benefits of the transition more fairly
Provides a clear, ambitious, and affordable path	No clear path	- Heavy reliance on emissions pricing would be less adaptive. Other policies would need to be developed if this pathway was changed and there are large lags in impacts from abatement policies -- This path is likely to be the least affordable as it does not seek to remove barriers to low-cost abatement	-- Heavy reliance on forestry would be the least adaptive pathway. It would be extremely difficult to reverse or change this pathway once forests are established. Other policies would need to be developed if the pathway changed ++ Due to the relatively low-cost of forestry removals this option is the most affordable in the long term	+ An integrated pathway is adaptive given the range of policies and actions that could be included within it. It also keeps other abatement options open for the future, which allows for uncertainty with different decarbonisation paths to be addressed + The focus on low-cost gross emissions abatement makes it more affordable
Preferred option	**An integrated package of strategies and policies is the preferred transition pathway for the ERP. This option performs strongly against all the assessment criteria compared to the status quo.**			

Example key for qualitative judgements:	
++	much better than doing nothing/the status quo/counterfactual
+	better than doing nothing/the status quo/counterfactual
0	about the same as doing nothing/the status quo/counterfactual
-	worse than doing nothing/the status quo/counterfactual
- -	much worse than doing nothing/the status quo/counterfactual

The preferred option is an integrated and balanced package of mutually supportive measures that prioritises gross emissions reductions, while maintaining incentives for afforestation to support a long-term carbon sink. We assess that this pathway best supports the Government's overarching objective of enabling an equitable transition to a low emissions and climate resilient future. In addition to this, the integrated package would put New Zealand on track to achieve the 2050 targets and address the projected shortfall between emissions and New Zealand's first emissions budget. It would also realise an appropriate balance of gross and net emissions reductions.

The other pathways perform better than the status quo against some criteria, and worse under others. There is less certainty whether a high reliance on emissions pricing or forestry would put New Zealand on track to meet the 2050 targets or achieve enough abatement in the short-term to meet emissions budget 1. A high reliance on emissions pricing would prioritise gross emissions reductions but could prevent reductions in net emissions still needed to efficiently meet the targets. On the other hand, a high reliance on forestry would not achieve the Government's objective of prioritising urgent and significant gross emissions reductions.

Further high-level assessment of the preferred package

For the integrated package of strategies and policies to be internally coherent it needs to be guided by clear objectives and principles and working towards a clear purpose. In line with the problem definition, and as stated in the LT LEDS, the main purpose of the ERP is to urgently reduce greenhouse gas emissions and increase carbon sinks, so that we meet our domestic emissions reduction targets. In doing so, we will also contribute to global efforts to limit temperature rise to 1.5°C.[19]

The development of individual policies and measures for inclusion in the ERP, both sectoral and cross-sectoral, is guided by the same principles that underpin the evaluation criteria in Table 4 and which are outlined in the ERP discussion document *Te hau mārohi ki anamata - Transitioning to a low-emissions and climate-resilient future*. Taken together, the individual policies and measures included in the package, while not being identical to those included in the Commission's demonstration pathway, are similarly intended to deliver an appropriate balance of gross and net emissions reductions across all sectors of the economy to put New Zealand on track to meet the 2050 targets.

The preferred package differs from/is similar to other options in the following ways:

1. A high reliance on emissions pricing would fail to achieve many low-cost emissions reduction opportunities due to the presence of other barriers. For this reason, this option is considered to have the highest economic cost. There are also risks with having a high reliance on the NZ ETS if it does not prove to be a viable option to reduce emissions in some sectors given the lags in implementing other abatement measures. This would risk slowing actions required to meet emissions budget 1.
2. A high reliance on forestry removals would not meet emissions budgets 1 or 2, and is not viable without other initial measures, although in the longer term these should not be required to meet budgets. This option is likely to have the lowest economic cost. However, there are questions about the sustainability of this option given available land and potential impacts on rural communities. Furthermore, this option has the highest risk compared to the other options given the predominant focus on a single abatement measure, namely exotic forestry.
3. Even with strong reductions in emissions, there is a critical ongoing role for forestry removals: to offset remaining emissions in hard-to-abate sectors, as a feedstock for a future bioeconomy, and to enable flexibility in our transition path. Afforestation continues to play a significant role in the Commission's pathway with over 1.2 million hectares of new forest planting established between 2022 and 2050. Afforestation is required over the next 5 years because only 23 percent of the forests recommended by the Commission for the second emissions budget period are currently planted. Further planting will be required after this to continue offsetting emissions, but the balance of exotic and native

[19] Te hau mārohi ki anamata: Transitioning to a low-emissions and climate-resilient future, p. 9

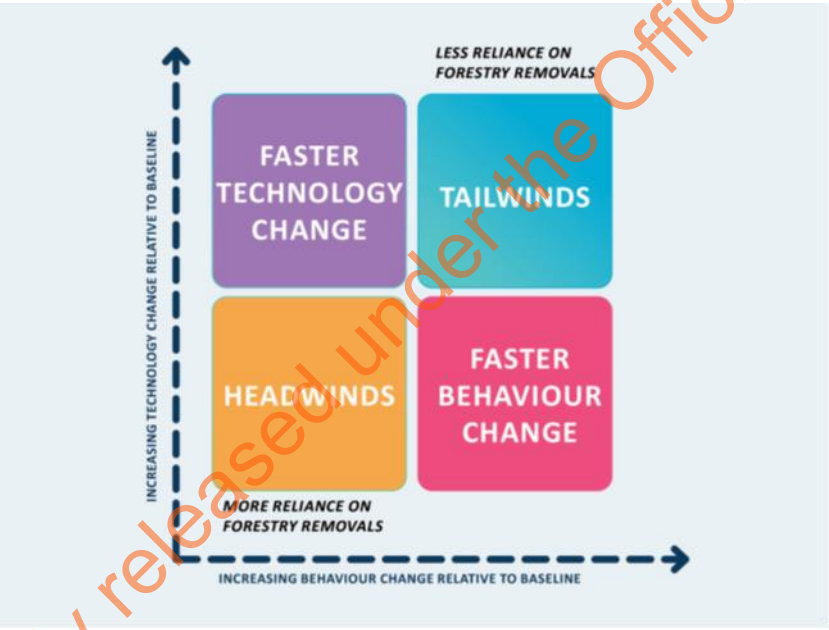
forests will shift over time to achieve the Government's objectives for the forestry sector.

4. The integrated approach includes a focus on research, science, innovation (RSI) and technology to provide new knowledge and technologies to support the transformation required to a green economy and a just transition, without relying solely on emerging technologies to meet emissions budgets. By building new innovative approaches, the RSI system can unlock new opportunities where New Zealand can capitalise and contribute to the global green economy, creating new businesses and jobs in the process. Without the RSI system's activity, New Zealand's response to climate change will be a cost to the country as we buy innovation from overseas.

Relevance to the Commission's advice

The Commission looked at multiple scenarios when modelling the changes required to reach 2050 targets. These scenarios encompassed future conditions being more or less favourable through various levels of technological and behaviour change optimism (see figure 2 - Scenario structure for the long-term scenarios to 2050 from the Commission's advice *Ināia tonu nei: a low emissions future for Aotearoa*).

Figure 2: the Commission's scenarios to achieve the 2050 target



The Commission also developed alternative pathways to its demonstration pathway, which included less technological change and more behaviour change and vice versa. In both the demonstration path and alternative pathways, the Commission modelled a package of policies and measures with action across all emitting sectors. This aligns at a high level with the preferred ERP transition pathway option.

The Commission also demonstrated that there are enough existing technologies and viable measures available now that can be implemented to meet its recommended emissions budgets – even under less optimistic scenarios.

Emerging technologies do not need to be relied on to meet emissions budgets. The preferred ERP pathway enables New Zealand to react if certain technologies become viable on a large scale through supporting the research, science and innovation sector and developing cross-cutting sector strategies. This could allow New Zealand to capitalise on emerging technologies in the future (such as utilising hydrogen as an energy source and the use of methane inhibitors in agriculture) without heavily investing and relying on these technologies to mature to meet our budget targets.

High-level assessment of the impacts and risks of the preferred ERP

Substantively repeating the Commission's whole of economy analysis would be redundant and impossible to do given timing and resourcing constraints.

The costs and benefits analysis (below) is instead based on the work of the Commission. One of the key assumptions is that the impact of their demonstration path is largely the same as the preferred option 4, as they are broadly aligned.

The Commission's analysis highlighted that there are substantial benefits from the transition to a low-emissions economy, and these will be in the form of reduced economic costs as well as co-benefits of abatement measures. We have identified the following benefits and costs from the preferred transition pathway:

1. Marginal abatement cost analysis by the Ministry for the Environment, the Commission and others has shown that in several emitting areas abatement actions will reduce both emissions and costs
2. Areas where this is the case and marginal abatement costs are expected to be negative now or in the near term include: heat pumps for space and water heating; LED lighting; electrifying the vehicle fleet; on-farm abatement; renewable electricity generation; and waste reduction
3. It is expected that a substantive portion of this abatement would occur anyway over time, however, there are substantial cost benefits if this abatement is brought forward
4. In some cases, higher upfront capital costs could deter investment in low emissions abatement actions in other cases a lack of information about options limits abatement
5. The preferred approach seeks to exploit these areas of negative cost abatement where the other options do not. This approach will reduce the costs of the overall transition to a low emissions economy
6. Enabling co-benefits is another area where the preferred option is expected to deliver more benefits than the other approaches
7. Reducing industrial emissions, electrification of transport, increasing active transport modes, improving house insulation and organic composting are all initiatives that have both emissions reduction benefits and health benefits
8. In addition to this, measures to increase native afforestation and increase pest management will increase forestry removals as well as increase biodiversity

9. Our climate response also creates significant opportunities for new jobs and higher wages. Opportunities include a growing global demand for low-emissions foods, products, and clean technology solutions.
10. There will be further employment opportunities across all our key sectors to enable the low-emissions transition - energy, agriculture, transport, building and construction, and waste
11. New sustainable investment brings with it other benefits: enhancing innovation and productivity with new technology, and further generating new economic activity
12. The fiscal implications of the preferred transition pathway will in part be addressed by the establishment of the Climate Emergency Response Fund. This fund has been set up to support delivery of key climate change initiatives on an ongoing basis and is underpinned by revenue earned through the NZ ETS.

While there are benefits in some areas overall, the costs of the other transition pathway options are expected to outweigh the benefits:

13. The economic costs of the transition to a low emissions economy are expected to be significant but the Commission's latest modelling suggests that the impact will be substantively less than past modelling has estimated
14. The Commission estimated that the transition based on their demonstration path (which is broadly aligned to the preferred option) would result in GDP being 0.5% lower in 2035 and 1.2% in 2050 than it otherwise would have been
15. The costs of the transition pathway can be from increased operational costs like the switching of coal for biomass, higher capital costs such as over-build of renewable generation capacity and public transport infrastructure, as well as reduced production (avoided)
16. The estimated costs are based on current assumptions and account for improvements in current technology such as electric vehicle batteries but not the development of new technologies such as a methane inhibitor
17. The Commission also modelled a scenario where key actions such as the uptake of electric vehicles and more efficient farm practices were delayed. Delaying key actions would lead to higher cost actions being required and make it harder to maintain agricultural production
18. The overall impact to GDP would be higher – potentially reducing GDP by up to 1.0% in 2035 and 2.3% in 2050 if key measures for New Zealand's low emissions transition are not successfully rolled out
19. Additional technologies are expected to be developed over time and would be expected to reduce the cost of the transition further. The Commission's analysis estimated that effective methane reduction technology would have a substantial reduction to economic costs
20. The high reliance on the emissions pricing option would be expected to increase the costs to the economy given it does not attempt to remove barriers to lower cost abatement
21. The Commission's modelling suggests that an approach that includes more forestry removals would reduce the economic cost, however, the Commission's scenario is not an unrestrained/high reliance on forestry scenario
22. The costs to the Government of the preferred transition are still being worked out but it is likely that they will be high compared to options 2 and 3, which would be expected to have relatively low costs to Government

23. The higher costs to Government stem from investments in infrastructure such as transport and waste, and incentivisation in areas like process heat, transport, and agriculture

24. The Commission's analysis informs our approach and is based on the best information that was available at the time. It is expected that as more information becomes available the optimal path may change, but the overall integrated approach will remain the same.

The preferred transition pathway option is expected to be more resilient to future uncertainties as it would utilise a range of measures, including emissions pricing and forestry removals to meet budgets. As policies and measures are rolled out as part of the ERP, the Government will learn more about its impact to inform future policy development. Over time, the Government will add to and improve the Commission's evidence to refine parts of the plan.

However, it is not possible to perform a cost-of-living analysis of the ERP in sum given the changing nature of strategies, policies, and programmes under the plan. The Treasury's analysis below will not be updated prior to lodgement. Individual sectoral RIA's will outline the distributional impacts of its policies.

On 2 May 2019, the Cabinet Environment, Energy and Climate Committee directed the Treasury, the Ministry for the Environment, the Ministry for Primary Industries and the Ministry for Business, Innovation and Employment to work collaboratively on advice to Ministers on the expected distributional impacts of possible high carbon prices in the ETS in 2020, 2025, and 2030 and possible policy options to mitigate these impacts [ENV-19-0016].

The resulting report was used as a preliminary analysis of the distributional impacts of the emissions pricing to inform upcoming decisions. Limitations in the modelling include the assumption that firms will pass through 100% of costs and that households will not reduce their consumption in response to rising prices. Only impacts in 2020 were able to be estimated.

The Treasury considers the advice given to have moderate reliability and moderate risk. Figures do not include any measures to mitigate impact on households.[20]

Analysis illustrated that low-income households are more affected, relative to income, because they spend a greater proportion of their income on emissions-intensive goods such as transport fuels.

Table 6: Annual change in total household income spent on fuels (petrol, gas, electricity) and food

Emissions Price (NZD per tonne CO2-e)	**Quintile 1**	**Quintile 2**	**Quintile 3**	**Quintile 4**	**Quintile 5**
Average annual disposable income (equivalised)	$23,180	$42,910	$60,360	$79,920	$138,790
$25	0	0	0	0	0
$30	$20	$28	$35	$37	$41
$35	$41	$56	$71	$76	$84

[20] Source: Treasury analysis.

$40	$62	$83	$106	$113	$125
$45	$83	$111	$142	$152	$167
$50	$103	$139	$177	$189	$209
$75	$207	$279	$355	$380	$419
$100	$310	$418	$532	$569	$627

The Treasury analysis showed that a rise from $50 to $75 would increase low-income household spending by $2 per week, and $4.10 per week for high-income households.

The current NZU spot price of 4 April 2022 sits at $76.00, and we expect that the figures outlined in Table 6 give an indication of potential distributional impacts. Noting that the NZ ETS cost containment reserve price trigger sits at $70 for 2022, NZU prices may stay within current levels and are not expected to drop sharply. If this occurs, it is likely we could see impacts comparable to this piece of analysis.

The Commission found that, in general, the cost of living would not increase. There could be higher electricity and fuel costs. Improvements in energy efficiency may be able to offset this, but lower-income households may require Government support through policy to assist making these transitions.

Over the long-term, the cost impact of higher emissions prices should decrease. Households and businesses will increasingly be able to take advantage of low-emissions alternatives to the current predominantly fossil-based technologies. The costs of transport and heating are likely to decrease in the middle to long-term, allowing households to switch to lower-carbon alternatives.

Governance, monitoring, and review arrangements

Meeting successive emissions budgets and delivering emissions reduction plans will require ongoing, active management across multiple government agencies. Management will need to respond to innovation opportunities, uncertainties about how New Zealand's emissions will change over time, the impacts of policies on society and the economy, and will need to provide for corrective action to be undertaken where it is required.

Many of the actions in the plan will align neatly with existing portfolio responsibilities, and individual Chief Executives are proven to deliver in these situations.

However, the plan also includes multiple cross-cutting actions and strategies that do not have a clear home agency. To adequately monitor the progress of the ERP over time, there will need to be a formalised monitoring and accountability framework focussed on the ERP with cross-agency input.

Governance arrangements

Cabinet has previously agreed that strong governance and accountability mechanisms are needed to keep the emissions reduction plan on track to ensure that any corrective action can be taken with high priority and urgency [CAB-21-MIN-0320.01 refers].

Cabinet also agreed that sector sub-targets be used to measure the progress of each sector towards meeting the emissions reduction plan and to set the sub-targets for the first emissions budget period [CAB-21-MIN-0547.02 refers].

Currently, the governance structure for the ERP includes:

1. The Climate Response Ministers Group (CRMG), which is a Ministerial oversight group chaired by the Prime Minister that meets every six weeks; and
2. The Climate Change Chief Executives Board (CE Board), which is comprised of the chief executives across multiple government agencies and also meets every six weeks.

The remit of these groups goes beyond the ERP, as they also oversee general climate and adaptation policy. These groups are supported by the Ministry for the Environment, which holds a secretariat function.

On 7 March, Cabinet agreed to formalise the CE Board as an Interdepartmental Executive Board under the Public Service Act 2020 [CAB-22-MIN-0055.01]. The main functions of the Board will be to:

1. coordinate implementation of cross-agency actions and strategies in the emissions reduction plan
2. advise Ministers on progress across the plan, which includes:
    - monitoring and reporting on implementation ("are we doing what we said we'd do?")
    - monitoring and reporting on effectiveness and impacts ("are we getting the benefits we thought we would?")
3. advise Government on policy responses to monitoring results, including shortfall or overshoot of the sector sub-targets
4. publish monitoring reports on the plan, sub-targets, and implementation.

The IEB will be supported through establishment of a dedicated cross-agency secretariat.

The Government must build on these governance structures to support implementation of the ERP, clarify accountability, and facilitate the ongoing decisions needed to manage progress and keep on track.

Monitoring arrangements

Implementation and policy effectiveness of the ERP will be closely monitored by the IEB's cross-agency secretariat. The secretariat will report to the IEB on the implementation and effectiveness of the ERP, and the IEB will coordinate policy development to address the 'overs and unders'.

Progress will be measured against sub-sectoral targets and key performance indicators included in the ERP. Where necessary, the IEB will support agencies to bring underperforming sectors back on track.

The secretariat will monitor the effectiveness of the ERP on a sector and economy wide level. This will include working with Treasury and MfE to assess associated fiscal risks of falling short against our climate targets.

The IEB will provide advice to Ministers on the ongoing and active management of the implementation of the plan, including:

1. Coordination of policy development over the life-cycle of the ERP

2. Providing advice on whether efforts can be accelerated or slowed down across sectors in the ERP
3. Supporting regular and timely reporting on progress at the economy, sector, and policy package levels.

This will deliver a fit-for-purpose monitoring and accountability framework governed by the IEB and CRMG, with a focus on prioritising the following:

1. Timely monitoring, to ensure that where underperformance is occurring, it is swiftly brought back on track
2. Monitoring effectiveness at the policy, sector, and economy level, to ensure that 'big picture' impacts are adequately identified
3. Robust distributional analysis, to determine whether the transition is equitable
4. Ensuring that the development and delivery of the ERP meet Treaty obligations and give due consideration to te ao māori perspectives
5. Clearly defined responsibilities for agencies, and guidance on how Ministers and agencies will be held accountable for delivering on components of the ERP
6. A tight feedback loop to ensure that monitoring insights inform new policy development.

The Commission will provide an external monitoring role that will supplement the work carried out by government agencies. The CCRA requires the Commission to monitor and review the Government's progress towards its emissions reduction and adaptation goals. Under sections 5ZK and 5ZL the Commission must report annually on the Government's progress in implementing the plan and again at the end of each emissions budget period on how emissions budgets were or were not met. The Government is required to publicly respond to these reports.

How will we judge the success of the ERP?

Successful implementation of the actions in the ERP requires coordinated action across government. To increase accountability the Commission recommended that the Government nominate specific Ministers and agencies to be accountable for implementing policies and strategies in the ERP.

The sub-sectoral targets and key performance indicators which will be included in the ERP will provide a baseline to monitor progress from. The final plan will also provide clarity on which agencies are responsible for implementation of the chapters of the ERP.

This information will give effect to the following proposal agreed by Cabinet in December 2021. Cabinet agreed to use sector sub-targets to measure the progress of each sector towards meeting the emissions reduction plan, enabling corrective action to be managed across the whole programme [CAB-21-MIN-0547.02 refers].

In March 2022, Cabinet agreed to nominate relevant Ministers and public sector Chief Executives to oversee progress against each sub-target for each sector covered by the ERP [CAB-22-MIN-0055.01].

Sector sub-targets are a useful tool for monitoring and managing the implementation of the ERP. They measure each sector's progress towards meeting its section of the ERP and promote development of sufficiently quantified policies. This will give confidence that we are on track to meet emissions budgets. They are also a clearly measurable method of holding sectors to account, which will assist the governing Chief Executives

and CRMG to be accountable for sector sub-targets relevant to their agencies, while also being responsible for the whole emissions budget.

Sector sub-targets are a useful tool for monitoring and managing the implementation of the emissions reduction plan. On 7 March 2022, Cabinet agreed to nominate relevant Ministers and public sector Chief Executives to oversee progress against each sub-target, as follows [CAB-22-MIN-0055.01]:

Sector (All gases, net (AR5)[1], expressed in $MtCO_2$-e)	**Emissions budget #1 (2022-2025)**	**Emissions budget #2 (2026-2030)**	**Emissions budget #3 (2031-2035)**	**Relevant agency or agencies**	**Responsible Minister**
Transport Energy	65.9	76.0	56.8	Ministry of Transport	Minister of Transport
Energy and ndustry	70.1	72.8	63.3	Ministry of Business, nnovation and Employment	Minister of Energy and Resources
Agriculture	159.4	191.0	183.0	Ministry for Primary ndustries	Minister of Agriculture
Waste	13.7	14.9	12.7	Ministry of the Environment	Minister for the Environment
F-gases	6.8	7.5	5.9	Ministry of the Environment	Minister for the Environment
Forestry	(24.9)	(55.2)	(79.6)	Ministry for Primary ndustries	Minister of Forestry
Total[2]	**292.0**	**307.0**	**242.0**	**Climate Change Chief Executives**	**Prime Minister**

Is the ERP sufficient to meet the first emissions budget (2022-2025)?

Since the interim RIS was completed considerable progress has been made identifying additional measures and increasing the estimated impacts of policies. Officials are now much more confident that the policies and measures have sufficient potential to achieve the reductions required in the first budget period. For instance, the proposed emissions budgets appear to be achievable based on current emissions projections and ERP policy impact assessments, as the current high to low policy impact range estimates with Tiwai Point remaining open are 296 to 289.5 Mt CO_2-e in EB1, 254 to 318 Mt CO_2-e in EB2 and 191 to 253 Mt CO_2-e in EB3.

Achieving the first emissions budget of 290 Mt CO_2-e for 2022-2025 will be tight, with the package of policies in this Plan expected to fall either just under or just over this first emissions budget. However, emissions budgets appear more likely to be achieved if the smelter closes or if the emissions reduction plan can be fully funded over time, well-implemented and potentially enhanced to ensure the plan delivers at the high end of the impact range. There is a high level of uncertainty inherent in all the assessments of emissions impact, as well as in forecasts of future activity.

If policies do not add up to meet the budget, New Zealand may be able to meet the first emissions budget through borrowing. This is a risk management tool that allows up to one per cent of the next emissions budget to make up a shortfall. The use of other tools, such as offshore mitigation and revising the level of the emissions budget, is limited and will only apply if certain criteria are met.

How will refinements/changes be made to the ERP if the objectives are not being met or there are some unintended consequences?

Under the preferred option, agencies' advice will inform decision-making by the CE Board and CRMG and will support them to identify issues and intervene early, improving delivery of the plan by providing a range of information. This will enable an adaptive management approach, where the Board and CRMG are able to use central agency system-wide oversights as well as specialised Ministry for the Environment advice to quickly and effectively adjust policy settings to meet emissions budgets.

The CE Board meets every six weeks, and its main functions will be to coordinate implementation of cross-agency actions and strategies in the ERP, advise Ministers on progress across the plan and publish monitoring reports. More detail is provided in page 30.

Mechanisms to enable the CE Board to effectively monitor and report progress in meeting emissions budgets are under development.

Further risk management tools include adjusting NZ ETS unit supply and price control settings and the provision in the CCRA that provides for up to one per cent of the next emissions budget to be borrowed to offset any shortfall. For the first emissions budget period (2022-2025), this would amount to around 3 $MtCO_2$-e and would be sufficient to cover a shortfall of around 25-30 per cent of the emissions reduction required.