
Executive summary

In line with our role as laid out in the Climate Change Response Act 2002 (the Act), He Pou a Rangi Climate Change Commission has prepared this advice to the Government on the direction of policy for its second emissions reduction plan, which will cover the second emissions budget period (2026-2030).

The Act established Aotearoa New Zealand's 2050 target, as well as the process for reaching it. Under the Act, the Government sets emissions budgets - which confirm the total allowable net emissions across a five-year period - and emissions reduction plans, which outline the actions it will take to achieve those budgets.

We have developed this advice in the interests of helping the Government fulfil its role in setting policies and strategies to meet the second emissions budget and ensuring Aotearoa New Zealand is on track to achieve the third emissions budget and the 2050 target.

As an independent Crown entity, our advice is based on research and expert analysis and has been informed by insights and evidence drawn from extensive engagement and consultation. Our focus is on clear and stable policy direction. Clarity and certainty will give households, businesses, and communities confidence to take up and invest in low emissions opportunities and are key to Aotearoa New Zealand's transition to a thriving, climate-resilient, and low emissions future.

As required by the Act, the Government will consider the recommendations and broader advice in this report before setting the second emissions reduction plan at the end of 2024. The policies and strategies in that plan will form the base of Aotearoa New Zealand's approach to achieving the second emissions budget, third emissions budget, and 2050 target.

Emissions are decreasing, but further Government action is needed

The transition to a low emissions future presents the opportunity for a healthier and more prosperous future for New Zealanders. For households, businesses, and communities, mitigating climate change will result in cleaner air, lower overall energy costs, new market opportunities, reduced risk of future inflation, and living in safer, more stable environments.

The uptake of electric vehicles, movement away from coal, and awareness of the importance of reducing agricultural emissions indicate that the country is committed to achieving a low emissions future, and is making real progress.

The latest National Greenhouse Gas Inventory data shows that Aotearoa New Zealand reduced its gross greenhouse gas emissions in 2020 and 2021. According to Stats NZ, that pattern has continued, with total industry and household emissions decreasing 3.9% from 2021 to 2022.

Government action is now needed to build on that momentum and to broaden, strengthen, and accelerate efforts to meet Aotearoa New Zealand's climate change objectives.

This report reflects Government policy as of October 2023. Each Government will have its own policy priorities and preferred approaches to action in relation to climate change.

In this advice, we take an outcomes-focused approach, identifying options the Government has in setting the second emissions reduction plan and laying out key opportunities and risks to inform decision-making.

Our recommendations to the Government identify areas where there are critical gaps in action, or where efforts need to be strengthened or accelerated to meet the second emissions budget and Aotearoa New Zealand's longer-term emissions reduction targets in a manner compliant with the Act. In this way, our advice draws from and builds on our previous work, including our 2021 report *Ināia tonu nei*.

These recommendations include actions that directly reduce emissions and those that are 'enablers', which support people to participate in and contribute to efforts to achieve emissions budgets and targets. For each sector, and across the broader system, we have identified where barriers currently deter low emissions choices, and where strategic investment can help drive deeper change over time.

Our advice report is divided into three parts:

- **Part 1:** Setting the scene
- **Part 2:** Fundamentals for success
- **Part 3:** Low emissions options for sectors and systems

Each part contains chapters focused on specific areas where Government action is needed to achieve emissions reduction outcomes, including the context and rationale for our recommendations.

International context

This advice is centred on the second emissions reduction plan, which is part of Aotearoa New Zealand contributing to the global effort under the Paris Agreement to limit warming to 1.5°C through domestic emissions reductions.

It is not, however, the full contribution that Aotearoa New Zealand makes to combatting climate change under either the Paris Agreement or other international pledges or activities. While these wider international efforts are not the main focus of this advice, they inform some aspects of it, and domestic action to meet emissions budgets can support achievement of these other goals.

Investments required to meet emissions budgets will save money in the long term

As part of *Ināia tonu nei*, we undertook extensive analysis and modelling in accordance with the matters required by the Act, which led to the development of a pathway to 2035: the demonstration path. The demonstration path reflects a suite of actions and outcomes that would set the country up to deliver the 2050 target in line with the Act's considerations and create options to manage uncertainty. This path was used as a basis for our advice recommending emissions budget levels for 2022–2025, 2026–2030, and 2031–2035.

This work included demonstrating that our recommended emissions budget levels were both ambitious and achievable. Our economic modelling indicated that the economy would continue to grow under the recommended emissions budgets. We assessed that the level of gross domestic product (GDP) could be around 0.5% lower in 2035 and 1.2% lower in 2050 than it would be in a scenario when there was slower action to reduce emissions, a conclusion consistent with findings overseas.

Through our work in *Ināia tonu nei*, we found that that while substantial investment is required to lower emissions in line with our proposed emissions budgets, this will likely be outweighed by larger future cost savings. Our analysis shows that by the 2040s, Aotearoa New Zealand can save around \$2 billion each year.

We determined these potential savings by looking at the costs of transitioning to low emissions across three key areas: road transport, space and water heating, and food processing. These areas account for around three-quarters of the reductions in long-lived greenhouse gas emissions by 2035 under the demonstration path.

Our projections for change across road transport, buildings and food processing showed if households and businesses decarbonise by electrifying heat and transport, costs would likely increase over the short term, but begin decreasing by the late 2020s, and decrease more sharply by the mid-2030s.

The economic benefits of an electrified economy, where citizens and businesses can avoid future inflation related to the rise of fossil fuel prices, are being recognised internationally, including through the enactment of the Inflation Reduction Act in the United States and the rapid growth of solar generation in Australia.

Part 1: Setting the scene

This first part of our report provides overall context for this advice.

Chapter 2: What we heard

This report has been informed by the perspectives and evidence of thousands of New Zealanders from across the motu, shared with us through engagements held over the course of the Commission's existence, and in hui and wānanga focused specifically on the second emissions budget period.

On 26 April 2023, we released the draft version of this advice to the public for consultation. Over the next eight weeks, we met with and heard from iwi/Māori, academics, businesses, communities, farmers, local government, NGOs, sector bodies, and individuals with the purpose of testing and improving our work.

We worked with iwi/Māori across multiple rohe on a case study approach to understanding the specific effects of climate change from an iwi/Māori-led perspective, called the Maui.Tech project.

Consultation on our draft advice closed on 20 June 2023. Commission staff read, considered, and analysed the approximately 300 submissions we received. As a result of our submissions analysis, we re-evaluated our approach, judgments, conclusions, and recommendations where appropriate.

Throughout this report, we have highlighted key themes and insights from consultation, and where our advice has shifted as a result of what we heard.

One such theme was the need for Government action to make it more possible for people to participate in and contribute to emissions reduction efforts, for example through effective funding mechanisms and national campaigns to support behaviour change.

Submissions from local government consistently expressed the need for more clarity on what is required of them in the transition and that their funding and legislative tools need to be consistent with those responsibilities.

Respondents discussed the importance of an equitable transition across sectors and society, and of supporting communities to adapt to change while navigating the impacts of a warming climate.

We heard that clarity on the Government's direction of climate change policy is key to empowering action, as is a cohesive and aligned approach across sectors and between central and local government. Across multiple areas of our advice, we heard concerns about the risk of policies unintentionally contradicting each other, making efforts to meet emissions budgets less effective.

Our analysis shows there is a risk that Aotearoa New Zealand's institutional and regulatory environment is not sufficiently aligned to enable meeting the second emissions budget or longer-term emissions reduction targets.

We recommend the Government align and coordinate institutional and regulatory outcomes within and between levels of government and across all sectors of the economy to support the coherent implementation of the second emissions reduction plan.

Part 2: Fundamentals for success

The second part of our report discusses how the Government can set conditions for achieving emissions budgets.

As outlined in the latest IPCC report, effective climate action is enabled by political commitment, well-aligned multilevel governance, institutional frameworks, laws, policies, and strategies, as well as access to finance and technology.

Developing, implementing, and monitoring effective climate policy which supports an equitable transition to low emissions will require coordination across a wide range of government agencies and levels of government, as well as with iwi/Māori.

Chapters focus on areas where Government actions will impact across multiple sectors and communities, including investment and finance, emissions pricing, and setting a path to net zero. Getting these fundamentals right is critical for achieving Aotearoa New Zealand's climate targets, as they will lead to effective emissions reduction across all emissions budget periods.

Chapter 3: The task for the second emissions budget

Evidence clearly demonstrates that meeting the second and third emissions budgets will require concerted and timely action at all levels of government and across all sectors.

In the first emissions reduction plan, the Government set sector sub-targets, expressed as the total emissions for each sector in each budget period. Comparing these sub-targets with the government's baseline scenario, which represents emissions prior to the introduction of policies from the first emissions reduction plan, shows where further emissions reductions are needed beyond 'business as usual'.

For the second emissions budget:

- the total quantity of emissions reductions needed is estimated at 43.5 MtCO₂e
- the largest share (around 40%) is expected to come from energy and industry, totalling 17.4 MtCO₂e
- the transport, agriculture, and forestry sectors are each expected to deliver reductions of 7-8 MtCO₂e
- the remaining 3.3 MtCO₂e is expected to come from waste and F-gases.

The fastest and most substantial emissions reductions are possible in electricity and heat production, through new renewable generation and moving away from coal and fossil gas heating. The main opportunities across other sectors include increasing electric vehicle uptake, shifting to low carbon transport, ongoing improvements in farming practices, and reducing organic waste disposal to landfills.

Decisions made in the second emissions budget period will impact Aotearoa New Zealand's ability to meet the third emissions budget. For example, the large jump in emissions reductions expected from transport in the third emissions budget relies on a rapid scaling up of electric vehicle sales in the 2020s. Without that early scaling up, a higher-emissions vehicle fleet will be locked in, making the necessary emissions reductions from transport more costly and disruptive.

This shows how seemingly small delays in the near term can lead to much higher costs and/or emissions over a budget period.

Similarly, policies in the first emissions reduction plan will contribute to meeting the second emissions budget and beyond. In the first emissions reduction plan, the Government released an assessment of the level of emissions reductions expected in each sector as a result of the plan's policies, out to 2035. Our reflection on this assessment provides a foundation for our analysis on what further Government action is needed to meet the second emissions budget and enable achievement of Aotearoa New Zealand's longer-term targets.

Under the latest government projections, published in Dec 2022, meeting the second emissions budget will require 20.7 MtCO₂eⁱ of emissions reductions in addition to the policies and measures already in place.ⁱⁱ If further planned policies and measures from the first emissions reduction plan were put in place, 14.0 MtCO₂e of additional emissions reductions would be needed.

While forests will continue to play a critical role in achieving emissions budgets, planting exotic forests during a given emissions budget period will not help to reduce net emissions in that same period. This is because when grassland is converted to forest, carbon dioxide is released into the atmosphere, and exotic trees generally do not "pay back" these carbon losses until four years after their planting.

i. For this figure, Commission analysis of the government's December 2022 emissions projects (adjusted for continued operation of the aluminium smelter) has an uncertainty range of 4.4 to 38.9 MtCO₂e, meaning the actual figure is expected to fall within that interval.

ii. Table 4.1 on page 45 shows the policies and measures included in both the 'with existing measures' and 'with additional measure' scenarios. < <https://environment.govt.nz/assets/publications/New-Zealands-Fifth-Biennial-Report.pdf>>

Chapter 4: A path to net zero

The Government has choices about the combination of gross emissions reductions (emissions reduced at the source) and carbon dioxide removals (primarily by forests) it will use to reach and sustain net zero emissions of long-lived greenhouse gases by 2050, as required by the Act.

The Government could set a path focused on gross emissions reductions, thereby requiring fewer removals. Alternatively, net zero could be achieved by increasing removals and sustained by ensuring any emissions of long-lived greenhouse gases after 2050 are balanced by an equal or greater quantity of removals from the atmosphere.

However, because the amount of carbon that can be stored on land is limited, an approach solely reliant on forest carbon removals is not viable indefinitely. Carbon stored on land is also increasingly vulnerable to events like fires and floods. If the Government's approach does not result in strong reductions of greenhouse gas emissions, achieving the 2050 target in a durable and equitable manner will be at risk.

Reducing gross emissions is a pathway strongly recommended by the Intergovernmental Panel on Climate Change (IPCC). Reducing gross emissions will bring benefits and opportunities including healthier homes and buildings, new market opportunities, and improved lives and choices for young people and future generations.

It is important that the Government clarifies and communicates its approach to gross and net emissions reductions, as this will impact how the net zero component of the 2050 target is met and the risks and impacts Aotearoa New Zealand will face as a result.

Clarity can also help make climate goals more achievable. For households, businesses, investors, communities, and local government, a clear and stable path to net zero is important for informed decision-making. If these stakeholders are confident on the way forward, they can invest in low emissions technologies like biomass boilers or heat pumps, and make choices and plans that are compatible with emissions reduction targets.

We recommend the Government commit to specific levels of gross greenhouse gas emissions and carbon dioxide removals for the second and third emissions budgets and align policies to achieve or exceed the emissions reductions in the budgets. Gross emissions should not exceed 362 MtCO₂e for the second emissions budget nor 322 MtCO₂e for the third emissions budget.

Setting out intended long-term outcomes now is important for a well-managed transition. The Government can ensure appropriate and comprehensive policies are put in place to achieve necessary gross emissions reductions, and sectors can make planning and investment decisions consistent with the overall emissions outcomes envisioned by the Government.

We recommend the Government communicate indicative levels of gross greenhouse gas emissions and carbon dioxide removals out to 2050 and beyond to guide policy decisions.

These committed and indicative levels must be developed in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

Chapter 5: Emissions pricing

The New Zealand Emissions Trading Scheme (NZ ETS) is central to Aotearoa New Zealand’s strategy to reduce greenhouse gas emissions. Putting a price on emissions changes the relative prices of goods and services across the economy. This influences the behaviour of both producers and consumers by discouraging high emitting activities and rewarding low emissions choices.

Our analysis shows that the NZ ETS as it is currently structured is highly unlikely to drive the gross emissions reductions recommended in *Chapter 4: A path to net zero* for reaching net zero emissions of long-lived greenhouse gases in a way that can be sustained.

Aotearoa New Zealand’s climate policies need to encourage both decarbonisation and afforestation, as both have essential roles to play in an equitable and sustainable low emissions transition. While the NZ ETS creates strong economic drivers for planting trees, it also allows carbon dioxide removals by forests to undermine the incentive to reduce emissions at their source. In the near term, this is expected to result in the NZ ETS driving extensive afforestation but only limited gross emissions reductions.

The consequences of this include that Aotearoa New Zealand will miss out on the gross emissions reductions that, as outlined in *Chapter 4: A path to net zero*, are important for improving the lives of young people and future generations, and modernising the economy so businesses are fit to compete in a low emissions world. It also has impacts for people and regions affected by land-use change, particularly rural communities that thrive on a diversity of land uses.

In addition, from the mid-2030s onwards the NZ ETS will not provide the durable incentives for planting the forests needed to reach net zero long-lived greenhouse gas emissions by 2050. Although this point is some years away, a plan to provide these incentives needs to be developed soon, as their absence in the late 2030s will impact forestry well before then. Investing in planting a forest is a long-term decision and investors need to have confidence about returns for decades into the future.

We recommend the Government align the emissions pricing system with the desired levels of gross emissions for the second and third emissions budget, and with the net zero 2050 target by amending the NZ ETS to separate the incentives for gross emissions reductions from those applying to forests, and by providing durable incentives for carbon dioxide removals by forests through to, and beyond, 2050.

The redesign of emissions pricing incentives must consider the unique characteristics and historical circumstances of land owned by Māoriⁱⁱⁱ and options must be developed in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

Between the April 2023 release of our draft advice and the publication of this final advice, the Government ran a public consultation on the role of forestry in the NZ ETS as part of a review of the scheme. The review aims to assess the desired role of the NZ ETS in driving gross emissions reductions while continuing to support removals, as well as the benefits, trade-offs, and risks of changing the NZ ETS.

iii. The terms ‘land owned by Māori’ and ‘Māori landowners’ are used in this report to cover the collective owners of Māori land (as regulated by Te Ture Whenua Māori Act 1993) and other Māori land entities which serve similar purposes. The distinctive characteristic is the collective ownership structure and its impact on land management and investment opportunities (as in our advice about Māori land in *Ināia tonu nei*, see pages 158 and 217).

This review is an important step towards developing a new structure for the NZ ETS so that it can better support Aotearoa New Zealand to reduce gross emissions, in addition to growing forests to remove carbon dioxide from the atmosphere. Its progression is also urgent, as prolonged uncertainty about the future of the NZ ETS will limit its ability to drive investments in reducing emissions. A key issue for the review's next stage will be to examine what transitional arrangements should apply to existing forestry participants and forestry units already circulating in the scheme.

There is growing interest in expanding the scope of the NZ ETS to include other carbon-storing activities, for example using harvested wood products, soils, vegetation, wetlands, or the marine environment ('blue carbon'). However, the NZ ETS may not be the best suited policy tool for all these opportunities. Land uses have multiple functions, and including them in the NZ ETS – which by its nature focuses only on carbon – could lead to unintended consequences caused by narrowly pursuing emissions reduction outcomes at the expense of other benefits, such as biodiversity or wider ecosystem services.

It will be important for the Government to determine the outcome of the NZ ETS review before making any decisions about expanding the coverage of the NZ ETS to include these new activities or land uses, as their inclusion could further erode the scheme's ability to drive gross emissions reductions.

Some carbon dioxide removal opportunities, such as vegetation and peatlands, are not yet included in Aotearoa New Zealand's method for measuring emissions against targets (target accounting). It is important that any decisions to include them in the NZ ETS or begin counting them towards targets do not weaken Aotearoa New Zealand's efforts to address climate change.

In *Ināia tonu nei*, we advised that expanding target accounting beyond the scope used to set existing targets would be cause for a review of the targets to ensure their integrity. This is important to prevent undermining the ambition of Aotearoa New Zealand's climate commitments, and is another reason to make decisions regarding the scope of the NZ ETS carefully, and with due consideration.

Some companies that produce goods in an emissions-intensive way and compete with goods produced overseas receive free allocations of units in the NZ ETS (industrial free allocation). This aims to address the risk that these businesses will reduce production due to the NZ ETS costs, leading to an increase in production offshore that increases global emissions (emissions leakage).

Current industrial free allocation policy is inconsistent with the NZ ETS incentivising net zero long-lived gas emissions by 2050.

While the Government recently passed an amendment Bill which aims to correct over-allocation (where firms are receiving more units than they need), further change will be needed over time. Issues to consider include:

- the benefits of industrial free allocations alongside the cost to taxpayers
- the changing international landscape and how this impacts the risk of emissions leakage
- the opportunities presented by other options, such as reallocating resources to invest in emissions reduction or exploring other means of addressing emissions leakage.

Chapter 6: Investment and finance

Investing in a shift to a low emissions economy makes good economic sense. Our analysis shows it would cost the country less over time to invest in emissions reductions, than it would to stay dependent on fossil fuels (and pay higher fuel costs later as fuel prices rise with inflation).

The emissions reductions required to meet Aotearoa New Zealand's climate change goals are within reach and can be funded if the right settings are created. Investment and finance is fundamental to emissions reductions in every sector, and as part of the second emissions reduction plan, Government action is needed to improve the operating environment for public, private, and institutional investors.

Private investment has an important role in achieving emissions budgets. A 2021 report from the UNFCCC's Race to Zero campaign found that from 2026, a global investment of USD \$4.5 trillion in decarbonisation per year is needed to reach net zero by 2050, with private actors accounting for up to 70% of those investments.

The way the Government invests public funds to lower emissions also matters, and Aotearoa New Zealand's ability to meet emissions budgets will be impacted by whether Government investments are in alignment with climate targets. Government investment decisions also send a message about what is important to New Zealanders and demonstrate the kind of change possible at a large scale.

As part of our work in *Ināia tonu nei*, we compared the demonstration path to the baseline of policies set before the first emissions reduction plan was implemented to get an overall sense of the potential investment needed to achieve the 2050 target. We found that reducing emissions in line with emissions budgets across electricity generation, food processing, the built environment, road transport, and native afforestation would require an additional investment of around \$38 billion (in 2021 dollars).^{iv}

That estimate of additional investment spanned the years 2022 to 2050, with roughly half of that amount (\$18 billion) needed in the second and third emissions budget periods to put Aotearoa New Zealand on a path to achieve future targets.

iv. This figure represents the difference between the demonstration path and the current policy reference baseline in our advice in *Ināia tonu nei*. It is only intended to provide an overall sense of potential investment needs rather than the full picture, as it did not include sectors such as agriculture nor assess different financing costs. Actual figures will also vary based on decisions made about the transition.

However, there are several barriers preventing the mobilisation of investment at the pace and scale required to meet emissions budgets and support climate resilience goals. We recommend the Government reduce the barriers – including regulatory, institutional, and ownership barriers – to mobilising public and private investment required to meet emissions budgets.

Its options to address these barriers include:

- amending components of the tax system (for example, adjusting depreciation schedules and rates for eligible projects)
- sharing and reducing investment risks with private investors, to attract more investment for low emissions projects
- further exploring debt financing, where a governmental or private sector organisation borrows money to fund a project and then pays the lender back with interest
- facilitating increasing climate knowledge in the finance sector and greater coordination and guidance for public and private reporting entities
- developing data collection, classification (or 'taxonomy'), and verification systems for climate friendly investment in Aotearoa New Zealand.

In addition, an integrated and centralised Government investment approach would help to guide Aotearoa New Zealand's transition and ensure a clear, consistent, joined up approach to maximise impact, minimise delays, and better enable individuals, businesses, agencies, and communities to play an active role. This would be a strong step forward in addressing regulatory and institutional barriers that may exist between different levels of government or state actors.

Chapter 7: Research, science, innovation, and technology

Meeting emissions budgets will require an accelerated transformation of Aotearoa New Zealand's research, science, innovation, and technology (RSI&T) system, which provides knowledge and insights to develop new low emissions options that are domestically relevant and affordable. The RSI&T system can also make existing solutions more accessible across the motu.

These activities, occurring across public and private sectors, include inventing new fuels and new ways of generating energy, and developing more efficient processes or technologies to reduce emissions from agriculture.

Through investment, regulations, procurement, trade agreements, workforce development, resource and development infrastructure, and standards-setting, the Government can facilitate and drive innovation.

Continuity in funding and programmes will be key in ensuring that the climate change science capacity and capability developed over the last decade is maintained. Targeted investment, supported by a clear set of priorities for climate change science and research, is needed to support the progression and adoption of new technologies.

Freely available climate change data and information, including on weather, water, ocean, air quality, and greenhouse gas levels, informs our understanding of how Aotearoa New Zealand's climate is changing. Currently, however, public fees and limitations on sharing data across government organisations and Crown Research Institutes are constraining access.

We recommend the Government provide adequate targeted investment and increased coordination and facilitate widespread sharing of freely available climate change data and information to enable a research, science, innovation, and technology system that supports achieving emissions budgets and the 2050 target.

Chapter 8: Whāia ngā tapuwae

Iwi/Māori have a key role in meeting emissions budgets and the 2050 target. Through partnership, the Government and iwi/Māori can accelerate the transition to low emissions and collectively build climate-resilient communities.

Close regard for the Crown-Māori relationship is important in setting the second emissions reduction plan, as its effectiveness is critical for an equitable transition, for the benefit of all New Zealanders. For Aotearoa New Zealand to achieve a fair, inclusive, and equitable transition to a low emissions future, iwi/Māori need to be able to:

- actively exercise rangatiratanga and mana motuhake
- access resources and information to achieve emissions reductions within their takiwā
- ensure their communities are resilient and are able to adapt to the effects of climate change while maintaining intergenerational economic, environmental, social, and cultural wellbeing.

To achieve this, it will be important for the Government to consider the role of iwi/Māori in the country's approach to reducing emissions as well as their specific, localised needs. This includes ensuring iwi/Māori are resourced and enabled to accelerate emissions reduction in accordance with tikanga and mātauranga Māori, and while realising the aspirations of their people and communities.

We recommend the Government introduce ways to directly allocate resources to iwi/Māori and augment funding to Māori landowners to enable them to accelerate emissions reductions and removals in accordance with their assessments and priorities.

Many iwi and other Māori landowners have a strong commitment to climate action and control significant assets that can contribute to a scalable low emissions transition. Through shared tikanga, values, assets, and an increasing number of Māori affiliated to iwi and other collectives, iwi/Māori have a range of skills, capabilities, and knowledge that can be mobilised quickly in response to climate emergencies.

Accelerating a general understanding of mātauranga Māori through collaboration with local iwi and hapū will build more locally relevant and enduring climate change solutions. If policy is developed without consideration of te ao Māori or inclusion of mātauranga Māori methodologies, it may lead to inequitable impacts and/or limit the ability of iwi/Māori to address and respond to climate change.

We recommend the Government ensure iwi/Māori are empowered to lead the weaving of mātauranga Māori into policy design, development, and implementation at central and local government levels. This includes providing sufficient resources to iwi and hapū.

Chapter 9: An equitable transition

A fair, inclusive, and equitable transition will endure, because it will be based on considering how decisions will affect different groups of people around the country. To increase policy effectiveness and avoid unintended consequences, the Government will need to manage the impacts and maximise the benefits and opportunities of actions to reduce emissions.

Acting to reduce emissions can provide health benefits, including improving mental health for young people and addressing the causes of physical health challenges related to cold, damp housing and air pollution, which research suggests costs Aotearoa New Zealand \$15.6 billion per year in health impacts.

Some industries, regions, and communities will be more affected than others by action to reduce emissions. It is important that the speed and nature of the transition is well signalled to allow time for businesses and communities to manage the change.

For sectors like renewable energy (including offshore wind, solar, and geothermal), the transition to a low emissions economy will likely mean an increase in demand for workers, while industries associated with higher emissions (such as steel, aluminium, or chemical production) may see a decrease.

While workforce changes in higher emitting sectors are expected to occur gradually, attention to workforce training and support for individuals and communities will be important to ensure New Zealanders have what they need to effectively navigate challenges and uncertainties associated with the transition.

If the Government's Equitable Transitions Strategy is to meaningfully address equity impacts in the second emissions budget period, implementation is urgently needed.

As announced, the strategy will only consider impacts related to emissions reduction policies. However, failing to consider emissions reduction and adaptation together can lead to decisions to prioritise one over the other, rather than making decisions that meet both goals. This was evident in the wake of Cyclone Gabrielle, with the Government revising its *Government Policy Statement on land transport* to focus less on reducing emissions and more on reconstructing or relocating damaged infrastructure and building greater resilience into the land transport system.

We recommend the Government expand the scope of the Equitable Transitions Strategy to also include the impacts of climate change and adaptation as well as mitigation.

Risks and barriers, including upfront costs, a lack of time and resources, the potential for inequitable impacts from emissions pricing, and split incentives – where the person or entity who could make a change is different from the beneficiary of that change – can make it harder for some to lower their emissions. Some communities will need targeted support through the transition, including support which enables them to take advantage of opportunities to reduce emissions and associated costs.

It is therefore highly important for the Government's upcoming Equitable Transitions Strategy to provide a comprehensive response to manage equity during the transition to a low emissions economy.

While the strategy remains in development, existing means of providing targeted support, such as the Energy Efficiency and Conservation Authority's Warmer Kiwi Homes programme, will continue play a crucial role in promoting equity while simultaneously reducing emissions. We recommend the Government manage the impacts of climate policies using existing policy levers until the Equitable Transitions Strategy is implemented, rather than delaying climate action.

Part 3: Low emissions options for sectors and systems

The third part of our report contains advice and recommendations for Government action within specific sectors and systems, each with an important part to play in meeting the second emissions budget.

Although these chapters are each focused on respective areas of the economy, effective policy requires the alignment of institutional and regulatory outcomes (as emphasised in Recommendation 1). Throughout these chapters, we note connections to other areas of our advice, and where emissions reductions in line with the second emissions budget will depend on coordination between local and national government.

Chapter 10: Agriculture

Reductions in greenhouse gas emissions from agriculture are central to meeting Aotearoa New Zealand's emissions reduction targets. Agriculture accounts for 91% of biogenic methane emissions and 94% of nitrous oxide emissions, together representing approximately 49% of gross greenhouse gas emissions.

The sector has already made progress in reducing emissions, but further changes will be needed to meet Aotearoa New Zealand's emissions reduction goals.

An effective agricultural emissions pricing system is a key tool for the Government to help meet the second emissions budget and to ensure achievement of the biogenic methane components of the 2050 target (reducing biogenic methane to 10% below 2017 levels by 2030, and 24–47% below 2017 levels by and beyond 2050).

In *Ināia tonu nei*, we recommended the Government commit to a pricing mechanism to incentivise on-farm emissions reductions. In our 2022 report *Progress towards agricultural emissions pricing*, we supported a farm-level pricing system for methane (rather than a processor-level), as our analysis showed that a more detailed system would be able to recognise and incentivise a greater range of on-farm actions by farmers to reduce emissions.

In August 2023, the Government set a final plan for a farm-level, split-gas levy to commence in 2025.

We now recommend the Government advance the agricultural emissions pricing system to continuously broaden the range of recognised low emissions practices and technologies, and to incentivise gross biogenic methane emissions reductions in a manner consistent with achieving the 2030 biogenic methane component of the 2050 target and the 2050 target in full. The pricing system should recognise existing low emissions practices such as alternative feed types and technologies in the pipeline like methane inhibitors.

New technologies, some land-use diversification, and on-farm efficiency increases will also help the sector make the change needed to achieve these goals while limiting impacts on agricultural production. Many of these shifts offer additional benefits; diversifying land can lead to economic and climate resilience, and increased biodiversity, water quality, and soil health, as well as benefits for rural communities who rely on livestock production.

To be in the best position to seize opportunities associated with transitioning the agriculture sector, farmers will require adequate support to reduce emissions. Advisory and extension services – services which support farmers with knowledge, advice, and support – will be important sources of information on which low emissions practices and technologies will be most effective and appropriate for each specific business.

We recommend the Government enhance advisory and extension services to farmers to accelerate land-use diversification and uptake of the technology and practices required to reduce gross emissions in line with emissions budgets and the 2050 target.

In line with the Government’s partnership under Te Tiriti/The Treaty, policy settings for the second emissions reduction plan need to reflect:

- the significant part agriculture plays in the Māori economy
- the unique characteristics of land owned by Māori, including specific constraints and challenges around land tenure and access to capital
- the relationship Māori have as tangata whenua to te taiao.

Advisory and extension services must therefore be co-designed, coordinated, and implemented in partnership with iwi/Māori, and should be developed in collaboration with industry.

Chapter 11: Built environment

The way cities, towns, and communities are designed affects emissions from land use, transport, buildings, energy, and waste.

Well-integrated policy, planning, and funding decisions related to the built environment can help to meet the second emissions budget and enable Aotearoa New Zealand to achieve its longer-term climate targets. This includes Māori-led approaches to weaving mātauranga Māori into decision-making.

International studies have demonstrated that, per person, greenhouse gas emissions in denser urban areas are less than half of those in low density areas. However, it is important that density does not occur in vulnerable coastal or lowland locations, or areas exposed to climate-related hazards that increase the risk that communities and systems such as electricity and communication networks will experience loss and incur more costs in the future.

We recommend the Government ensure planning systems are integrated and support building urban areas upward and mixing uses in order to reduce emissions, while decreasing susceptibility to climate-related risks.

In consultation, we heard from a range of respondents calling for greater policy coordination to address potential conflicting system outcomes, seeking a consistent national approach to delivering low emissions infrastructure. There are clear barriers to developing renewable generation under existing legislation, including the unresolved conflicts between various National Policy Statements.

During the second emissions budget period, the National Planning Framework, regional spatial strategies, natural and built environment plans, and other national policy instruments will be introduced or amended. Appropriate and clear direction will need to be reflected across all relevant Acts and policy instruments to support the transition to a low emissions society.

How buildings are designed, built, used, and located will impact emissions and our ability to adapt to climate change for generations. While the condition and performance of existing buildings is highly variable across Aotearoa New Zealand, there are technologies that can make them healthier, safer, and more energy efficient. These include installing insulation, upgrading windows, improving weathertightness, and switching away from fossil fuel heating and cooking.

Over their lifetime, technologies like heat pumps can save consumers money, as they are more energy efficient than their higher emissions alternatives, like gas heaters. However, there are currently limited incentives to retrofit given the upfront costs associated with equipment and installation, potential space requirements, and disruptions during construction.

We recommend the Government accelerate comprehensive retrofits to deliver healthy, resilient, low emissions buildings.

Many households, businesses, marae, and community centres use fossil gas for heating, cooking, and hot water, and the number of new connections to the fossil gas network continues to grow.

Continued fossil gas use will add additional cost to consumers and raise equity issues for future generations. Fossil gas installation that occurs during the second emissions budget period could endure to 2050 and beyond, despite affordable and technically viable low emissions alternatives, like electricity, being available now.

Residential and small commercial customers contribute around 65% of the total revenue of gas pipeline businesses despite only consuming around 20% of the volume. Historically, gas transmission and distribution charges have made up approximately 40-45% of the average consumer gas bill.

To meet the 2050 target, the use of fossil gas to heat water and space in the built environment needs to decrease. We recommend the Government prevent the installation of new fossil gas infrastructure and connections in buildings except where there are no technically viable low emissions alternatives.

Chapter 12: Circular economy and bioeconomy

Aotearoa New Zealand's resource use largely follows a linear pattern: extract-make-use-dispose. In contrast, a circular economy – encouraging reuse, repair, regeneration, and recycling – optimises energy and resource use.

Established international evidence demonstrates the emissions reductions possible through circular economy strategies. Efficient and more circular use of materials in just four key industrial materials (cement, steel, plastics, and aluminium) could help reduce global greenhouse emissions by 40% by 2050. Similarly, using circular approaches within the food system could reduce global emissions by nearly half.

Regulated product stewardship increases the circularity of products through the producers and importers taking responsibility for the waste and negative environmental impacts generated throughout a product's lifecycle and taking action to minimise these impacts. Through right to repair legislation, which establishes a legislative right for a consumer to repair their products through access to information, tools, and parts, Aotearoa New Zealand could reduce its electronic waste, estimated at 19.2 kg per capita.

We recommend the Government strengthen product stewardship and expand coverage across products and packaging to help avoid emissions associated with waste.

Estimates suggest that construction and demolition waste may represent up to 50% of all waste generated in Aotearoa New Zealand, with approximately 20% going to landfill and 80% going to cleanfill sites. Among this type of waste, wood waste is common, generating emissions through its production, transport, and disposal. Emissions can be reduced by diverting wood waste away from landfill for reuse.

We recommend the Government declare construction material wood waste as a priority product to help reduce emissions from construction and demolition waste.

The 'bioeconomy' refers to the parts of the economy that use renewable biological resources (biomass) to produce food, products, and energy.

By offering alternatives to higher emissions activities and processes, the bioeconomy can contribute to emissions reductions in the short and long term. For example, in the Commission's demonstration path, use of biofuels (such as forestry residue and pulp logs) avoided significant fossil fuel emissions (from coal and petrol). Avoided emissions were estimated at 1.5 MtCO₂e in the first emissions budget period, 4.8 MtCO₂e in the second emissions budget period, and 8.1 MtCO₂e in the third emissions budget period.

In addition to contributing to climate change mitigation and adaptation, the bioeconomy has the potential to increase the value of the economy overall. The value of the global circular bioeconomy is estimated to reach US \$7.7 trillion by 2030.

Aotearoa New Zealand's bioeconomy is currently centred on primary agricultural and forestry industries, which mainly produce exports. The 'new' bioeconomy model involves using sustainable natural resources, reducing waste and pollution, and transitioning away from fossil fuel dependence – all in support of economic and social outcomes.

As sector projections suggest that demand for fossil fuel replacements is likely to quickly exceed Aotearoa New Zealand's capacity to produce biomass fuels, a strategic approach to the use of bioresources is needed. Contributing to emissions budgets through the bioeconomy also depends on access to robust data and information. For example, market participants need to know that a bio-based product will perform at the same level as the equivalent carbon-intensive product for the bioeconomy to develop.

We recommend the Government provide overarching guidance and an enabling regulatory framework to advance a circular bioeconomy that reduces emissions and increases resilience to climate change, ensuring cross-sector coherence.

Chapter 13: Energy and industry

Changing energy supply and industrial processes can lead to significant emissions reductions within the second emissions budget period, with projections totalling 17.4 MtCO₂e, or 40% of the total reductions needed to meet the budget.

This figure is equal to this sector's emissions in 2021 (also 17.4 MtCO₂e), which represents over 20% of Aotearoa New Zealand's total emissions for that year. The Government's sector sub-target for energy and industry emissions averages 14.6 MtCO₂e per year for the second emissions budget.

Energy emissions are generated through everyday activities like heating and cooling homes. Industrial emissions come from activities like burning coal to generate electricity.

Both energy supply operations and industrial processes can invoke mana whenua and mana moana interests under Te Tiriti/The Treaty, given the extent of the infrastructure involved and associated impacts on te taiao.

Electrification is key for decarbonisation, and the system must be able to deliver secure, affordable, and low emissions electricity. Renewable electricity generation build therefore needs to scale up quickly. To meet anticipated demand, we estimate that each year from 2025, generation that can supply over 1 TWh per year will need to be built. This is equivalent to around two very large wind farms being completed every year (although we expect a mixture of renewable generation types, including geothermal and solar).

Energy sector estimates of future investment needed indicate that realising the vision of an electrified economy could require an estimated total investment of \$42 billion by 2030 across generation, transmission, and distribution infrastructure providers. This would address historical under-investment, meet future needs, and strengthen grid resilience.

However, policy settings and other factors are creating investment uncertainty and delaying build, which could directly increase emissions. The consenting system can enable a fast-paced and sustained build of renewable generation, but stronger direction is needed to remove barriers to building new renewable generation or re-consenting existing generation. Improving grid resilience has also become increasingly urgent.

We recommend the Government prioritise and accelerate renewable electricity generation build and ensure electricity networks can support growth and variability of demand and supply.

These outcomes must be progressed in partnership with iwi/Māori, particularly considering potential implications for mana whenua and mana moana and their rights and interests.

Rapidly reducing industrial emissions is crucial to meeting the second emissions budget. Significant decarbonisation can occur in low-to-medium temperature process heat during the first and second emissions budget periods. Under the Commission's demonstration path, industrial emissions reduce from 10.9 MtCO₂e in 2021 to 8.9 MtCO₂e in 2030.

However, there are barriers (including technical constraints and workforce challenges) that need to be addressed to reduce industrial emissions. For example, there are not enough people in Aotearoa New Zealand with the required skills and expertise (including design engineers, electricians, boilermakers, and fitters/turners) to deliver emissions reduction projects across the economy simultaneously and at pace.

While to date the Government has focused on capital cost barriers in low-to-medium temperature process heat, there are opportunities for further emissions reductions if policy support was put in place to address a range of non-price barriers. There are some sectors that have received little attention to date, resulting in a lack of information or enabling policies to reduce emissions.

We recommend the Government accelerate the decarbonisation of process heat and pursue opportunities to reduce emissions across other industrial sectors.

Meeting the net zero component of the 2050 target will require steadily phasing down fossil fuel use and maximising the supply and efficient use of renewable energy. Making these changes in a way that focuses on people and communities can deliver positive outcomes across energy affordability and accessibility, community resilience, health, and socio-economic opportunities.

Chapter 14: Forests and other carbon stocks

Forests, which remove and store carbon from the atmosphere, are critical to the pathway to achieving the net zero component of the 2050 target.

As forests take a long time to establish, grow, and begin having an impact on carbon in the atmosphere, clear policy direction is needed quickly. At the same time, the strong connection between forestry and Māori land ownership, and the relationship Māori have as tangata whenua to te taiao, emphasises the need for policy to be developed in a manner that honours Te Tiriti o Waitangi/The Treaty of Waitangi.

Further policy direction is needed to clarify the role of forests – including the area and types of forestry – to achieve emissions budgets and the 2050 emissions reduction target.

According to the sector sub-targets in the first emissions reduction plan, a net total of 57.2 MtCO₂e are to be removed and stored by forests in the second emissions budget period, and 81.6 MtCO₂e in the third. The Commission's demonstration path shows these targets could be achieved by planting an average of around 30,000 hectares per year of fast-growing exotic forests (*Pinus radiata*) and 20,000 hectares per year of native forests through to 2035.

Currently, incentives created by the NZ ETS largely determine the forest landscape of Aotearoa New Zealand, with wide-ranging implications. By considering the many environmental, cultural, social, and economic benefits forests provide, policy decisions can be aligned to better support climate change mitigation, adaptation, and resilience.

While forests offer significant benefits, including improving water and air quality as well as land stabilisation, there are also significant challenges related to using forests as a carbon removal strategy. Forests carry a risk of carbon release due to floods, fires, pests, storms, disease, and human activity. There are also issues related to the cost of establishing native forests, and concerns over land-use change and land availability.

Long-term carbon removal therefore needs to be maintained via diverse, multifunctional, and resilient landscapes. We recommend the Government clarify the intended roles of different types of forests in achieving emissions budgets and targets. The effects of different types of forests on ecosystem services, socioeconomic factors, rural communities, and resilience to hazards and climate change must be considered in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

The Government has recently launched the development of a Carbon Removals Strategy – intended to be included in the second emissions reduction plan – which will consider how carbon removal activities can be used to meet emissions budgets and the Nationally Determined Contribution under the Paris Agreement.

As part of this strategy, it will be important to consider the principles of additionality (the concept that activities to carbon removals only matter if they are in addition to the status quo) and permanence (how long carbon is expected to be stored), and to include them as criteria for any recognised removal activities.

Chapter 15: Transport

Transport emissions, which made up 18% of Aotearoa New Zealand’s gross greenhouse gas emissions in 2021, need to reduce rapidly and on a steepening trajectory to achieve the 2050 target.

The transport system connects individuals, whānau, and communities to one another and to places where they learn, work, live, and play. It delivers essential goods and services around the country.

However, the transport system is also a major source of greenhouse gas emissions. More than 90% of those emissions come from road transport. Nearly 70% of road emissions come from light vehicles (those under 3.5 gross tonnes) and about 30% come from heavy vehicles (those over 3.5 gross tonnes). The remaining transport emissions are from domestic aviation (6%), shipping (1.5%) and rail (less than 1%).

Our analysis, supported by internationally recognised approaches, shows that emissions can be reduced by avoiding, shifting, and improving transport use. For example, reducing trip distances and changing short trips to active transport (walking and cycling) can help achieve the Government’s target of reducing Vehicle Kilometres Travelled (VKT) in the light vehicle fleet by 20%, relative to the baseline projection, by 2035.

Transport infrastructure that supports safe walking, cycling, and public transport provides New Zealanders with low emissions ways to connect. However, infrastructure in Aotearoa New Zealand has been consistently underfunded. Te Waihanganga Infrastructure Commission estimates the current day infrastructure deficit to be approximately \$100 billion.

Delivering a low emissions transport system in Aotearoa New Zealand will require significant investment to overcome the existing infrastructure deficit, and a reorientation of this funding to prioritise infrastructure that enables low emissions forms of transport.

Local governments are responsible for a large portion of the funding for transport infrastructure and make many of the funding decisions that shape cities. Ensuring adequate funding to achieve needed emissions reductions will require stronger coordination between central, regional, and city/district entities.

Per person, only 5% of kilometres travelled were by active or public transport between 2019–2022, meaning Aotearoa New Zealand is lagging behind many countries when it comes to uptake of low emissions transport.

In addition, the current planning and consenting processes contain significant complexities, and major projects are funded inconsistently between central and local government. Both contexts create additional barriers to delivering low emissions transport infrastructure at the pace required.

We recommend the Government simplify planning and increase investment in integrated transport infrastructure and services that optimise public and active transport. We also recommend the Government provide dedicated long-term funding for the construction of integrated cycle and rapid transport networks in major population centres.

Alongside increasing walking, cycling, and public transport, transitioning vehicles to zero or low emissions technologies will play a critical role in decarbonising transport. Charging infrastructure, both public and private, is crucial to the success of the transition to electric vehicles. However, there are barriers to increasing both public and private vehicle charging infrastructure which will need to be overcome to support electric vehicle uptake.

These barriers include the capacity of existing electricity distribution lines, which can be partly managed by requiring smart charging, and by adopting default off-peak charging (ordinarily overnight) to reduce the burden on the grid, allow cost effective investments in infrastructure, and reduce costs for homeowners.

We recommend the Government rapidly upscale vehicle charging infrastructure, including removing existing barriers.

While light commercial vehicles and trucks constitute only 19% of vehicles, they contribute 49% of road transport emissions. Outside of core transport sectors, an estimated 1.5 billion litres of petrol and diesel are consumed in off-road applications, contributing 3.9 MtCO₂e per year, with a significant portion coming from off-road vehicles.

Off-road vehicles encompass many types of vehicles, including utes, all-terrain vehicles (ATVs), and tractors, as well as heavy machinery like combine harvesters, diggers, forest machinery, and recreational marine activities. Uptake of zero emissions commercial and off-road vehicles is currently slow due to a combination of significantly higher cost, limited supply, and the lack of supporting infrastructure.

To address the emissions from these vehicles, policies incentivising decarbonisation will be required. We recommend the Government accelerate the uptake of zero emissions commercial vehicles, including vans, utes, trucks, and offroad vehicles.

Chapter 16: Waste and fluorinated gases

Reducing waste emissions is a key area for Government action to enable Aotearoa New Zealand to achieve the 2030 biogenic methane component of its 2050 emissions reduction target, as 9.1% of these emissions come from organic waste breaking down in landfill.

The Government can accelerate a reduction in methane emissions from landfills by decreasing the volume of organic waste that goes to landfill and improving landfill gas capture systems.

Avoiding and managing organic waste directly reduces emissions. However, where the disposal of organic waste to landfill cannot be avoided, or where regulations will take several years to take effect, highly efficient landfill gas capture systems will enable emissions reduction and increase innovation.

We recommend the Government ensure the use of landfill gas capture systems and technologies is widespread and efficient. This will require robust and reliable data, and we therefore also recommend the Government improve the accuracy and transparency of landfill gas capture data.

Investment in organic waste processing and resource recovery infrastructure is needed within the second emissions budget period. Without a long-term waste infrastructure plan, Aotearoa New Zealand may not develop the facilities necessary to significantly divert organic waste away from landfill by 2030.

Thermal waste-to-energy facilities have the potential to undermine future goals for waste reduction and recycling and could displace the use and advancement of renewable electricity generation options. A precautionary approach to waste-to-energy policy and investment considerations is therefore important.

F-gases, commonly introduced to replace harmful ozone-depleting substances, are powerful greenhouse gases. Because of their high warming potential, it is important that F-gases are appropriately monitored, and that regulation, including requirements for F-gas labelling and traceability, is enforced. Managing the impact of F-gases during the second emissions budget period will also require measures that prevent F-gas leakage and ensure appropriate degassing prior to recycling or disposal.

Industry best practice guidance and guidelines to support refrigerant training, management, and tracking could further support the transition, especially if supported by government oversight. Restrictions targeting the import and sale of equipment pre-charged with greenhouse F-gases would prevent continued use of these gases in areas where viable alternatives exist.

Equity is inherently connected with reducing emissions from waste. More strategic government support and resourcing to support food rescue could also promote equity and support wellbeing for many people facing food insecurity in Aotearoa New Zealand.

Final Recommendations

This section shows our initial proposed recommendations, which were in the draft advice we consulted on, as well as our final recommendations to the Government.

Recommendation proposed in draft advice	Final recommendation
New recommendation following consultation.	We recommend that in its second emissions reduction plan, the Government: #1 Align and coordinate institutional and regulatory outcomes within and between levels of government and across all sectors of the economy to support the coherent implementation of the second emissions reduction plan.
Commit to a specific level of gross emissions for the second and third emissions budgets no less ambitious than 362 MtCO ₂ e and 322 MtCO ₂ e respectively, and ensure that its policy choices align with delivering this outcome.	#2 Commit to specific levels of gross greenhouse gas emissions and carbon dioxide removals for the second and third emissions budgets and align policies to achieve or exceed the emissions reductions in the budgets. Gross emissions should not exceed 362 MtCO ₂ e for the second emissions budget nor 322 MtCO ₂ e for the third emissions budget. The levels the Government commits to for gross emissions and carbon dioxide removals must be developed in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

Recommendation proposed in draft advice

Final recommendation

We recommend that in its second emissions reduction plan, the Government:

Communicate indicative levels of gross emissions and carbon dioxide removals from forestry out to 2050 and beyond to guide policy development.

#3

Communicate indicative levels of gross greenhouse gas emissions and carbon dioxide removals out to 2050 and beyond to guide policy decisions.

The levels the Government communicates for gross emissions and carbon dioxide removals must be developed in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

Make the emissions pricing system consistent with delivering the specific levels of gross emissions for the second and third emissions budgets, and with the 2050 net zero target, by:

- a. implementing an amended NZ ETS that separates the incentives for gross emissions reductions from those applying to forestry
- b. developing an approach that can provide durable incentives for net carbon dioxide removals by forests through to and beyond 2050.

#4

Align the emissions pricing system with delivering the desired levels of gross emissions for the second and third emissions budgets, and with the 2050 net zero target, by:

- a. amending the NZ ETS to separate the incentives for gross emissions reductions from those applying to forests
- b. providing durable incentives for net carbon dioxide removals by forests through to, and beyond, 2050.

The redesign of emissions pricing incentives must take into account the unique characteristics and historical circumstances of land owned by Māoriⁱ and options must be developed in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

New recommendation following consultation.

#5

Reduce the barriers - including regulatory, institutional, and ownership barriers - to mobilising the public and private investment required to meet emissions budgets.

i. The terms 'land owned by Māori' and 'Māori landowners' are used in this report to cover the collective ownership of Māori land (as regulated by Te Ture Whenua Māori Act 1993) and other Māori land entities which serve similar purposes. The distinctive characteristic is the collective ownership structure and its impact on land management and investment opportunities (as in our advice about Māori land in *Ināia tonu nei*, pp. 158 & 217).

Recommendation proposed in draft advice	Final recommendation
	We recommend that in its second emissions reduction plan, the Government:
<p>New recommendation following consultation.</p>	<p>#6 Provide adequate targeted investment and increased coordination, and facilitate widespread sharing of freely available climate change data and information to enable a research, science, innovation, and technology system that supports achieving emissions budgets and the 2050 target.</p>
<p>Accelerate Iwi/Māori emissions reductions in conjunction with climate change adaptation initiatives by exploring and implementing a mechanism to allocate resourcing direct to Iwi, and increase funding to Māori landowners (Te Ture Whenua entities).</p>	<p>#7 Introduce ways to directly allocate resources to Iwi/Māori and augment funding to Māori landowners to enable them to accelerate emissions reductions and removals in accordance with their assessments and priorities.</p>
<p>Ensure Iwi/Māori can drive the integration of mātauranga Māori into policy design, development, and implementation at central and local government level, by delivering sufficient resources to Iwi/hapū.</p>	<p>#8 Ensure Iwi/Māori are empowered to lead the weaving of mātauranga Māori into policy design, development, and implementation at central and local government levels. This includes providing sufficient resources to Iwi and hapū.</p>
<p>Enable a fair, inclusive, and equitable transition for New Zealanders by expanding the scope of the Equitable Transitions Strategy to include compounding impacts of climate change and adaptation as well as mitigation.</p>	<p>#9 Expand the scope of the Equitable Transitions Strategy to also include the impacts of climate change and adaptation as well as mitigation.</p>

Recommendation proposed in draft advice

Final recommendation

We recommend that in its second emissions reduction plan, the Government:

Make use of existing mechanisms to manage impacts of climate policies in the interim, rather than delaying climate action.

#10
Manage the impacts of climate policies using existing policy levers until the Equitable Transitions Strategy is implemented, rather than delaying climate action.

Advance the agricultural emissions pricing system to:

- a. enable recognition of a broader range of emissions-reducing practices and technologies
- b. incentivise gross emissions reductions in line with the 2050 target.

#11
Advance the agricultural emissions pricing system to:

- a. continuously broaden the range of recognised low emissions practices and technologies
- b. incentivise gross biogenic methane emissions reductions in a manner consistent with achieving the 2030 biogenic methane component of the 2050 target and putting the country on a trajectory to achieve the 2050 target in full.

Enhance advisory and extension services to farmers to enable them to respond to pricing and accelerate the adoption of emissions-efficient practices, appropriate land-use diversification, and emerging technologies to reduce gross emissions. These services should be co-designed and implemented in partnership with industry and iwi/Māori.

#12
Enhance advisory and extension services to farmers to accelerate land-use diversification and uptake of the technology and practices required to reduce gross emissions in line with emissions budgets and the 2050 target.
These services must be co-designed, coordinated, and implemented in partnership with iwi/Māori, and should be developed in collaboration with industry.

Implement an integrated planning system that builds urban areas upward and mixes uses while incrementally reducing climate risks.

#13
Ensure planning systems are integrated and support building urban areas upward and mixing uses in order to reduce emissions, while decreasing susceptibility to climate-related risks.

Recommendation proposed in draft advice	Final recommendation
	We recommend that in its second emissions reduction plan, the Government:
Incentivise comprehensive retrofits to deliver healthy, resilient, low emissions buildings.	#14 Accelerate comprehensive retrofits to deliver healthy, resilient, low emissions buildings.
Prohibit the new installation of fossil gas in buildings where there are affordable and technically viable low emissions alternatives in order to safeguard consumers from the costs of locking in new fossil gas infrastructure.	#15 Prevent the installation of new fossil gas infrastructure and connections in buildings except where there are no technically viable low emissions alternatives.
New recommendation following consultation.	#16 Strengthen product stewardship and expand coverage across products and packaging to help avoid emissions associated with waste.
New recommendation following consultation.	#17 Declare construction material wood waste as a priority product to help reduce emissions from construction and demolition waste.
New recommendation following consultation.	#18 Provide overarching guidance and an enabling regulatory framework to advance a circular bioeconomy that reduces emissions and increases resilience to climate change, ensuring cross-sector coherence.

Recommendation proposed in draft advice

Final recommendation

We recommend that in its second emissions reduction plan, the Government:

Prioritise and accelerate renewable electricity generation build and ensure electricity distribution networks can support growth and variability of demand and supply.

#19

Prioritise and accelerate renewable electricity generation build and ensure electricity networks can support growth and variability of demand and supply.

These outcomes must be progressed in partnership with iwi/Māori, particularly considering potential implications for mana whenua and mana moana and their rights and interests.

Pursue more widespread process heat decarbonisation and establish mechanisms for other industrial sectors and processes to decarbonise.

#20

Accelerate the decarbonisation of process heat and pursue opportunities to reduce emissions across other industrial sectors.

Set and implement integrated objectives for the role of forests with respect to emissions mitigation and adaptation, while giving effect to the principles of Te Tiriti o Waitangi/The Treaty of Waitangi.

#21

Clarify the intended roles of different types of forests in achieving emissions budgets and targets. The effects of different types of forests on ecosystem services, socioeconomic factors, rural communities, and resilience to hazards and climate change must be considered in partnership with iwi/Māori under Te Tiriti o Waitangi/The Treaty of Waitangi.

Simplify planning and increase funding of integrated transport networks that optimise public and active transport.

#22

Simplify planning and increase investment in integrated transport infrastructure and services that optimise public and active transport.

For major population centres, the Government should also complete cycleway networks by 2030 and take steps to complete rapid transport networks by 2035.

#23

Provide dedicated long-term funding for the construction of integrated cycle and rapid transport networks in major population centres.

Recommendation proposed in draft advice	Final recommendation
Rapidly resolve the barriers to scaling up vehicle charging infrastructure.	<p data-bbox="804 551 1390 618">We recommend that in its second emissions reduction plan, the Government:</p> <p data-bbox="804 674 1358 775">#24 Rapidly upscale vehicle charging infrastructure, including removing existing barriers.</p>
Develop incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks.	<p data-bbox="804 842 1291 976">#25 Accelerate the uptake of zero emissions commercial vehicles, including vans, utes, trucks, and offroad vehicles.</p>
Apply regulatory and policy instruments to achieve the optimal use and efficiency of landfill gas capture systems and technologies at all landfills.	<p data-bbox="804 1046 1331 1146">#26 Ensure the use of landfill gas capture systems and technologies is widespread and efficient.</p>
Improve the accuracy and transparency of landfill gas capture data by reviewing and strengthening relevant regulatory and policy tools.	<p data-bbox="804 1249 1262 1350">#27 Improve the accuracy and transparency of landfill gas capture data.</p>

Te reo Māori glossary

Kupu/rerenga kupu Māori and English contextual translations:

He Pou a Rangi

The Climate Change Commission's te reo Māori name, meaning 'a pillar of the sky'. The concept considers our role as upholders of the sky. We are honouring the sky and, in turn, have a duty to care for it

Māori landowners

refers to the collective ownership of Māori land (as regulated by Te Ture Whenua Māori Act 1993) and other Māori land entities which serve similar purposes – see our advice about Māori land in *Ināia tonu nei*ⁱⁱ

motu

country, nation, island

rohe

regions, tribal districts, territories

hui

meetings

wānanga

workshops, discussions

rangatiratanga

right to exercise authority and autonomy, self-determination, self-management

mana motuhake

mana through self-government and self-determination, control over one's own destiny

takiwā

districts, regions, often interchangeable with *rohe*, or can be a subsection of a *rohe*

ii. He Pou a Rangi Climate Change Commission, *Ināia tonu nei: a low emissions future for Aotearoa* (Wellington: He Pou a Rangi Climate Change Commission, 2021) <<https://www.climatecommission.govt.nz/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf>> [accessed 18 September 2023] (pp. 158 & 217).