Chapter 13

Aronga Kaupapa – Kia whakauru ki ngā rāngai tumatanui
Policy direction that cuts across sectors

Summary

In this chapter we give advice on policy direction that cuts across different sectors, which is important for enabling change at a systems level.

1. **Amend and continually improve the NZ ETS** to make sure it incentivises reductions in gross emissions.
2. **Make sure that every major decision the Government makes is consistent with climate goals**. Climate change goals should be factored into all government policy and investment decisions. This includes decisions by local governments, as well as by Crown agencies, Crown entities and Crown-owned companies.
3. **Drive low-emissions innovation.** The Government can help make sure Aotearoa will have more options for reducing its emissions in the future by putting in place measures to support and encourage research, development and innovation for low-emissions solutions.
4. **Mobilise public and private finance.** Making sure public investments support low emissions outcomes will be important. The Government also needs to help redirect private capital away from emissions intensive activities and towards low emissions investments.
5. **Make it easier for people to make lower emissions choices**. The Government needs make it easier for people to make choices that are better for the climate. It should establish a lead agency and a dedicated fund to support behaviour change.
6. **Develop a clear plan for how to move Aotearoa towards a more circular economy**. This will encourage people to use less and reuse more. This can lower emissions across supply chains. Good data and measurement will be needed to support this.
7. **Deliver a strategy for a bioeconomy**. The bioeconomy can reduce emissions across supply chains by using waste from agriculture, forestry, and households in place of fossil fuels. It will be important to look at the bioeconomy system in an integrated way.
8. **Change the way cities and towns are planned and designed.** The Government needs to do what it can to improve existing communities to support emissions reductions, and make sure that new developments are planned in a way that is compatible with a low emissions future.

Changes in our final advice

We have brought our bioeconomy, circular economy and urban form recommendations into this chapter in response to public feedback that they are all much broader than any one sector.

We did not previously have an over-arching recommendation on research and development, so we have added advice on this after coming through in submissions as an important theme.

We have also given more prominence to finance in our advice. The draft advice focused on climate-related disclosures and aligning investments for climate outcomes. This has been broadened to emphasise the importance of mobilising public and private capital towards investments that are net-zero compatible.

We have strengthened our advice on behaviour change and been more specific in our recommendation that Government should establish a dedicated fund and nominate a lead agency.

We have broadened the recommendations in our draft advice on ensuring emissions are factored into every policy and investment decision that government makes, to also include Crown agencies, Crown entities and Crown-owned companies.

We have amended the wording in the NZ ETS recommendation to improve clarity.

Introduction

1 As discussed in *Chapter 11: Approach to developing advice on policy direction*, the Government needs to implement a comprehensive suite of policies to achieve and sustain emissions reductions in line with targets. This includes policies across the three areas of intervention identified in our policy framework:

- Action to address barriers
- Pricing to influence investments and choices
- Investment to spur innovation and system transformation

2 Significant action will be needed within specific sectors – for example, to drive changes to how energy is generated, the way people travel, or how land is used. However, some important changes also need to cut across sectors to enable change at a systems level.

3 Drawing on our policy framework, this chapter contains six recommendations that will help to drive change across all sectors, and at the system level.

4 Amending the New Zealand Emissions Trading Scheme (NZ ETS) will have impacts that cut across sectors by boosting the price signal and incentivising businesses and individuals to make choices that lower emissions. Measures at the system level are needed alongside the NZ ETS to help overcome market problems and to spur innovation.

5 Action is also needed in some areas that cuts across sectors, for example, to support a more circular economy, develop a bioeconomy, and reduce emissions from towns and cities. This will require coordination across government, while working in partnership with local government, industry, business, and other stakeholders.

6 During consultation, submitters to the *2021 Draft Advice for Consultation* highlighted the country's response to the COVID-19 pandemic as an important example of what is possible. Some noted that it showed how strong leadership can lead to rapid and dramatic changes and achieve great outcomes.

7 There were strong calls for the Government to respond to climate change with similar urgency and to learn lessons from the COVID-19 response, including the importance of 'going hard and going early'.

Box 13.1: The New Zealand Emissions Trading Scheme (NZ ETS)

The NZ ETS was established in 2008. Its emissions price applies to around half of all emissions in Aotearoa, covering the following sectors:

- Liquid fossil fuels (mainly petrol, diesel and aviation fuel used in domestic transport)
- Stationary energy (mainly fossil fuels used for heat and electricity generation)
- Industrial processes (such as making steel, aluminium or clinker)
- Waste (operating landfills)
- Synthetic gases (fluorinated gases used as refrigerants or in electrical switchgear)
- Forestry

Forests are treated differently in the NZ ETS depending on if they were planted before 1990 or after 1989.

Participation in the NZ ETS for post-1989 forests is voluntary, so there is a significant area of this forest that is not in the scheme. If registered in the NZ ETS, these forests can earn units for the carbon they store as they grow, but units must be paid back for the loss of carbon on deforestation.

Pre-1990 forests cannot earn units but are subject to a mandatory liability to pay units to the Government if they are deforested (see Box 10.1 in *Chapter 10: Rules for measuring progress towards emissions budgets and 2050 targets* for more information).

Nitrous oxide and methane emissions from agriculture are not covered by the NZ ETS emissions price. The Government is currently aiming to implement an alternative farm-level emissions pricing scheme for these emissions by 2025.

Some businesses receive free units from the Government because they undertake activities that are both emissions intensive and trade exposed. This is called industrial free allocation. Free allocation recognises that NZ ETS costs might affect the international competitiveness of these activities, causing production to shift offshore in a way that increases global emissions.

An effect of this free allocation is a weaker incentive to reduce emissions from these activities. In 2019, total industrial free allocation was 8.3 million units. In comparison, gross emissions from covered sectors other than forestry was 38.8 million tonnes CO_2e.

13.1 Strengthen market incentives to drive low emissions choices

8 Emissions pricing is a powerful tool, and an essential component of an effective policy package for reducing emissions, as discussed in *Chapter 11: Approach to developing advice on policy direction*. In Aotearoa, the main emissions pricing instrument is the NZ ETS.

9 A strong theme that we heard during consultation was a lack of trust in the effectiveness of the NZ ETS, in part based on its limited impact on emissions over the first decade of implementation. A significant number of submissions called for it to be replaced by other policies, particularly a carbon tax or to a lesser extent, by a different type of trading scheme.

10 Since 2016, there have been a series of reforms to the NZ ETS to improve its effectiveness and give it the framework it needs to have more impact – including a cap on emissions.

11 Stability and political commitment to climate policies are two of the most important factors needed to give businesses the confidence to invest in reducing emissions. Dismantling the NZ ETS and attempting to replace it with a different policy would create a great deal of uncertainty and would likely delay much needed action to reduce emissions. In effect, emissions trading schemes and carbon taxes are also very similar policies, and share many features and challenges.

12 For these reasons, we do not see a compelling case for replacing the NZ ETS with a different type of emissions pricing policy.

13 The NZ ETS will need adjusting on an ongoing basis to keep it fit for purpose. The NZ ETS now has much of the architecture it needs to be effective, but further improvements are needed, detailed below.

13.1.1 Amend the NZ ETS to drive gross emissions reductions

14 The Commission's advice on meeting emissions budgets and the 2050 target focuses on reducing gross emissions wherever possible, as outlined in *Chapter 5: Recommended emissions budgets*. This is a departure from current policy, and from the way the NZ ETS is currently operated.

15 The NZ ETS in its current form does not differentiate between carbon removals by forests and gross emissions reductions. If left unchanged, this will drive the relatively low short-run cost abatement option of planting pines, rather than more costly gross emissions reductions that put Aotearoa on a path to net zero that is sustainable over the long term beyond 2050.

16 Carbon removals by fast-growing tree species, such as pine, can offset an amount of gross emissions, but this benefit is one-off. It does not reduce ongoing gross emissions, and, to maintain the one-off benefit, the planted land must remain in forest permanently.

17 This puts a burden on current and future generations because it reduces the flexibility of land use and only delays the need to reduce gross emissions. These drawbacks have informed the Commission's advice on the proportions of emissions reductions and removals for meeting emissions budgets.

18 To deliver outcomes aligned with this advice, the NZ ETS will have to be amended to decouple the incentive for gross emissions reductions from forestry. There are several options that could achieve this, all of which involve amending the NZ ETS's rules on forestry or on use of forestry units.

19 How best to achieve this decoupling will need to be carefully considered and consulted on, to understand the implications and avoid unintended consequences. The Government will need to undertake the detailed analysis on the best way to make this change, rather than the Commission. Further discussion of this and other issues connected with the NZ ETS and forestry is in *Chapter 18: Policy direction for forests and other carbon stocks*.

13.1.2 Adjust NZ ETS unit volumes and price control settings to align with budgets

20 The Commission's recommended emissions budgets differ from the provisional emissions budget that was used to inform NZ ETS unit supply and price control settings for 2021-2025.

21 In 2021, unit supply and price control settings must be updated to cover the 2022-2026 period. These settings include the volume of units to be auctioned in the NZ ETS as well as the auction reserve and cost containment reserve trigger prices, which start at $20 and $50 respectively in 2021.

22 The Commission's modelling indicates that meeting the 2050 target will involve marginal abatement costs to reduce emissions from energy use higher than these NZ ETS auction price control settings, at around $140 in 2030.

23 In addition to this indicative value our evidence suggests that in process heat, a sector where an emissions price can be expected to play an important role in driving decarbonisation, significant opportunities exist at costs from around $50 upwards.

24 The value of $140 in 2030 should not be interpreted as a forecast of the NZ ETS market prices. The actual prices observed in the NZ ETS will depend on the mix of policies implemented to meet emissions budgets.

25 The more the Government chooses to complement the NZ ETS with other policies, the more likely it is that the New Zealand Unit (NZU) price in the NZ ETS can be lower while still achieving the same overall emissions reductions.

26 Regardless of the policy combination the Government chooses, the auction reserve and cost containment reserve price triggers in the NZ ETS both need to be higher. The price corridor they signal should be sufficiently wide to allow price discovery by the market to occur and factor in inflation to prevent the price levels from eroding in real terms.

27 The NZ ETS cost containment reserve trigger price should be set well above expected market prices. An initial step up in value, to mitigate risks that it will be triggered and add to the NZU stockpile, should be followed by annual increases to give a trajectory that allows for prices of at least $140 in 2030.

28 The auction reserve price trigger should also step up to a higher value closer to recent market prices, to ensure price continuity and to safeguard existing investments (we note the afforestation levels in our modelling are based on an assumed emissions price of $35). Annual increases after this can be more moderate than those to the cost containment reserve trigger price, to manage risks of creating unintended speculative opportunities.

29 The unit volumes making up the NZ ETS cap, including the amount of units to be auctioned, will also need to be updated to reflect the first and second emissions budgets. Both unit volume and price control settings should continue to factor in the need to reduce the NZU stockpile.

13.1.3 Improve NZ ETS market governance

30 Effective governance of the NZ ETS is important for the integrity and efficiency of market trading and to reduce the risks of misconduct.

31 The Government has recognised that the regulatory framework governing conduct in the NZ ETS market is patchy and incomplete.

32 It has established a work programme to address the lack of effective governance and associated risks, which include insider trading, market manipulation, false or misleading advice to participants, potential lack of transparency and oversight of trades in the secondary market, money laundering, credit and counter-party risks and conflicts of interest.

13.1.4 Address other NZ ETS-related issues

33 There are a range of other NZ ETS-related issues that also need progressing. They are already being worked on within government and it is important that this work continues. They include:

- **Considering options for recycling some or all of the cash generated from NZ ETS unit auctions**

34 For example, these proceeds could be invested in emissions reductions, assisting communities or local authorities with adapting to the impacts of climate change, climate education, equitable transitions or helping Aotearoa to meet its Nationally Determined Contribution.

35 Any plan for use of these proceeds should consider how to provide appropriate support to Iwi/Māori and have governance arrangements that ensure equitable outcomes for Iwi/Māori. We note that support for recycling the proceeds of emissions pricing was a strong theme in consultation feedback.

- **Continuing to implement the legislated process for phasing out industrial allocation**

36 A number of submitters expressed strong support for eliminating industrial allocation entirely. Others were concerned that the phase-out will increase emissions leakage risk, with potential adverse impacts on their business or employment.

37 We note, however, that the legislation includes the ability to decrease the mandated phase-out rates on the basis of the Commission's assessment of emissions leakage risk.

38 We note that if agricultural emissions are priced, either in the NZ ETS or in an alternative pricing mechanism, the methods, level and phase-out of agricultural free allocation will need to be appropriately designed. See *Chapter 17: Policy direction for agriculture* for more information.

- **Reviewing other aspects of industrial allocation policy**

39 In particular, the government must consider overallocation risks, eligibility rules, updates to the Electricity Allocation Factor and allocative baselines.

- **Exploring alternative policy instruments that could address the risk of emissions leakage**

40 Potential instruments include product standards, consumption taxes and border carbon adjustments, given that ongoing output-based industrial allocation is not compatible with deep decarbonisation.

41 We note that these options all come with challenges. For example, there are questions around how border carbon adjustments could be made compatible with international trade law. This means that they are likely to be potential options for the longer term, rather than implemented as replacements for industrial allocation in the near future.

42 Consultation feedback on this issue was mixed. Some submitters were supportive, but others were concerned about the potential use of trade measures to achieve climate change goals, particularly scope for these measures to be used against Aotearoa.

- **Providing more information to reduce uncertainty about adjustments to NZ ETS settings**

43 This will help to build confidence in the market and support informed decision making by market participants.

44 The flexible design of the NZ ETS cap allows significant scope for cap adjustments over time. Looking forward, the way the cap is set can factor in forecast emissions or removals, either within or outside of NZ ETS coverage. Under certain circumstances, the cap can also be amended after it is set, taking into account actual emissions performance and revisions to forecasts.

45 This flexibility is useful, given that significant emissions and removals, such as those from post-1989 forests not registered in the scheme, remain outside of the NZ ETS. The downside is the uncertainty, and therefore risk, that these adjustments create for market participants.

46 Providing more information about how this flexibility will be exercised would reduce uncertainty for participants. In particular, it would be useful for the Government to clarify how it intends to manage NZ ETS unit volumes in light of the split-gas 2050 target and the planned inclusion of biogenic agricultural emissions in a separate pricing mechanism.

47 One option the Government could consider would be to outline its approach to making adjustments to the NZ ETS cap over time in a published document or policy. This would help to reduce uncertainty about future unit supply and feed into price expectations.

- **Clarifying the role and avenues for voluntary mitigation in Aotearoa.**

48 Some individuals and businesses wish to undertake voluntary action to contribute towards or go beyond meeting the country's emissions reduction targets. Failure to leverage this desire for voluntary action in addition to government policy would be a missed opportunity to deliver further climate benefits.

49 Businesses and other organisations are already making voluntary commitments, including for carbon neutrality, which may be based on incorrect expectations about using NZUs for voluntary offsetting. This is therefore a matter that should be clarified as a priority, so that voluntary market participants understand the options available to them for making robust voluntary mitigation commitments or claims.

50 Any government guidance should also take into account the accounting issues connected with voluntary offsetting and carbon neutral claims, which are discussed in *Chapter 10: Rules for measuring progress towards emissions budgets and 2050 targets*. Some submitters requested that the Commission provide detailed guidance about how to enable voluntary mitigation. However, detailed policy design and decisions sit with the Government, rather than the Commission.

Recommendation 11

Strengthen market incentives to drive low-emissions choices

We recommend that, in the first emissions reduction plan, the Government commit to:

Amending and continually improving the NZ ETS so that it delivers the incentives needed to achieve emissions budgets.

This should include:

1. Amending the NZ ETS to strengthen the incentive for gross emissions reductions and to manage the amount of exotic forest planting the NZ ETS drives, in line with the Commission's advice on the proportion of emissions reductions and removals necessary for meeting emissions budgets (see also Recommendation 25).
2. Updating NZ ETS unit supply and price control settings to:
   a. Align unit volumes with emissions budgets, taking into account the need to reduce the NZU stockpile.
   b. Increase the cost containment reserve trigger price to $70 at the first possible opportunity and then every year by at least 10% plus inflation.
   c. Maintain continuity with recent prices, by increasing the auction reserve trigger price to $30 as soon as practical, followed by annual increases of 5% plus inflation per year.
3. Establishing an effective market governance regime for the NZ ETS as soon as possible to mitigate risks to market function, delivered through an interagency team.
4. Continually improving the NZ ETS, including by:
   a. Developing and implementing a plan for recycling proceeds from NZ ETS unit auctions into emissions reductions, adaptation, climate education, equitable transitions and meeting international climate change obligations. This plan should include mechanisms to ensure that it contributes to equitable outcomes for Iwi/Māori.
   b. Implementing the legislated process for review and phase-out of industrial free allocation, reviewing other aspects of industrial free allocation policy to ensure they are fit for purpose and exploring other policy instruments that over the longer term could be used to address the risk of emissions leakage.
   c. Providing more information to reduce uncertainty about adjustments to NZ ETS settings, to support informed decision-making by market participants.
   d. Urgently clarifying the role and avenues for voluntary mitigation in Aotearoa, so that businesses and other organisations can understand the options available to them for making robust voluntary commitments or claims.

Recommendation 11

Provisional progress indicators

1. Government to have, by 31 December 2022, developed proposals for strengthening the NZ ETS incentive for gross emissions reductions and managing the amount of exotic forest planting driven by the scheme, with amendments to be effective by 31 December 2024.
2. Government to ensure that, in the next annual update to NZ ETS settings, unit volumes are aligned with emissions budgets and price control settings are increased.
3. Government to develop proposals by 30 June 2022 for establishing an effective market governance regime for the NZ ETS, and to have legislated to address the most significant risks by no later than 30 June 2023.
4. Government to develop and publish a plan for recycling proceeds from NZ ETS unit auctions by 30 June 2022, followed by annual reporting on the implementation of the plan and how the proceeds have been used.

13.2 Make investments net-zero compatible

51 To meet emissions budgets and achieve the 2050 target, it is important that policy decisions and investments made now do not lock Aotearoa into a high emissions development path, or increase exposure to the impacts of climate change.

52 Safeguards and signals will be needed to prevent this, including a specific focus on ensuring long-lived assets such as infrastructure are net-zero compatible.

53 Incorporating long-term abatement cost values consistent with climate change goals into the Government's cost-benefit or cost-effectiveness analysis would have a powerful effect in helping to make sure policy and investment decisions are net-zero compatible. This is sometimes termed a 'shadow price' on emissions and is common practice internationally.

54 As discussed in *Chapter 11: Approach to developing advice on policy direction*, emissions pricing incentivises businesses and individuals to make choices that lower emissions. Shadow emissions pricing anticipates future emissions prices and complements emissions pricing through the NZ ETS because it helps decision makers account for emissions impacts and costs over the project's entire lifetime.

55 Shadow emissions prices are especially important for government policy and investment decisions that involve large resources, or that become long-lived or irreversible once made. This includes significant national infrastructure investments, such as those being made to support the post COVID-19 recovery.

56 Work has progressed on developing an approach to incorporating shadow emissions prices into government decision making. However, it is not yet widely embedded within government processes or consistently applied.

57 The use of shadow emissions prices by local government and the private sector would also help to make sure other infrastructure and investments are future proof.

58 However, some local government submitters noted that they face capacity and capability challenges when it comes to factoring costs into long-term investment decisions, and called for more guidance from central government for how to do this well. Some private entities will face similar challenges and may also need guidance.

59 The Commission's modelling has enabled a better understanding of the marginal abatement costs likely to be required in Aotearoa to meet the emissions budgets and 2050 target. Our analysis suggests that marginal abatement costs of around $140 per tonne of CO_2e abated in 2030, and $250 in 2050 in real prices, are likely to be needed to reduce emissions associated with energy use, as outlined in *Chapter 5: Recommended emissions budgets*.

60 This information should inform the values used for policy and investment appraisal in Aotearoa. However, this information is not complete, as it primarily relates to the energy and transport sectors. It would therefore be prudent to treat these abatement cost estimates as conservative and use a range of values or sensitivities in analysis.

61 For example, the UK Government uses a set of central, high and low carbon values in its policy appraisals, as outlined in its Green Book framework for policy and project appraisal.

62 Over time, the abatement cost values used will need to be updated as the evidence base improves and extends to non-energy related abatement costs.

Recommendation 12

Make investments net-zero compatible

We recommend that, in the first emissions reduction plan, the Government commit to:

Ensuring policy decisions and investments made now support Aotearoa moving towards a thriving, climate-resilient and low-emissions society.

This should include:

1. Starting to factor shadow emissions prices into policy and investment analysis in central government immediately.
2. Encouraging and facilitating local government and the private sector to use shadow emissions prices by, for example, providing guidance to upskill and grow local government capacity to use them in their policy and investment analysis.
3. Measuring and reporting on how the post-COVID-19 economic stimulus is delivering climate benefits and the transformational investment needed to reach the climate and economic goals.
4. Requiring Crown agencies, entities and Crown-owned companies to include climate change as part of their decision making. This should be a particular focus for long-lived investments such as housing and transport infrastructure, to help achieve emissions reduction and climate-resilience objectives, and should include embedded emissions.

13.3 Enable system level change through innovation, finance and behaviour change

63 Aotearoa needs to speed up efforts to create and adopt new technologies and systems to give people and businesses more, better and less costly ways of reducing their emissions. To achieve this, government, business and industry will need to make significant investments in innovation and infrastructure.

64 To support this the Government needs to take action to mobilise public and private capital to support low-emissions outcomes, and make it easier for researchers, industry and businesses to develop, adapt and deploy innovative technologies.

65 The Government will also need to address behavioural barriers that prevent people and businesses from making the most of cost-effective opportunities to reduce emissions, by putting in place policies and programmes to enable New Zealanders to make choices that support low emissions outcomes.

13.3.1 Accelerate transition through innovation and research, development and demonstration

66 Transitioning Aotearoa to low emissions will require innovation right across the economy. Aotearoa is likely to be a technology taker in some areas, but innovation will still be needed to absorb, adapt, and deploy new technologies and processes developed elsewhere.

67 Low-emissions research, development and demonstration (RD&D) is about creating new technologies and process that reduce emissions – for example, inventing new ways of generating energy, new fuels, developing more efficient processes, or technologies to reduce emissions from agriculture.

68 Innovation is broader than RD&D, it is the process of converting knowledge and ideas into new and better ways of doing things. Innovation includes adapting, absorbing and extending the reach of technologies and knowledge generated through RD&D.

69 Innovation can play a central role in speeding up emissions reductions and reducing costs. Yet, innovation is costly and risky, and can be hard for many businesses to justify in the face of competing pressures. Success depends on access to knowledge, skills and finance.

70 As discussed in *Chapter 11: Approach to developing advice on policy direction*, emissions pricing through the NZ ETS provides some encouragement for the development of new technologies and practices. However, it does not provide the full incentive that would exist if all the co-benefits of low emissions innovation were considered.

71 The spillover benefits of innovation and RD&D justify more direct support, which would help to maximise and accelerate the benefits.

72 The Government should ensure it has well-designed policies and support in place to enable researchers, industry and businesses to develop, adapt and deploy innovative technologies in Aotearoa. This could include both direct and indirect support.

73 Direct support could include measures such as RD&D tax incentives, research grants and intellectual property regulation. More indirect support could include measures to increase the supply of skilled workers and researchers, and to improve access to financing and venture capital.

74 There is already a considerable body of local and international research looking at how government can most effectively support innovation, including from the Productivity Commission.

75 Ensuring support for RD&D and innovation that aligns with broader societal goals is important, and the transition to a low-emissions society is a key priority that should be reflected in the Government's approach.

76 It is important to note that RD&D and innovation bring gains over long timeframes, so incentives need to be in place early to drive the innovation needed to support a cost-effective path to meeting the 2050 target.

13.3.2 Mobilise finance for low emissions investments

77 Investment will be needed right across the economy to support the transition to low emissions. It is essential for funding innovation and RD&D, as well as infrastructure, equipment and more efficient processes to reduce emissions, including to enable responses to emissions pricing.

78 The important role of finance was highlighted during consultation, with some submitters noting that access to finance and investment capital will underpin emissions reductions in every sector. Some submissions from business, industry and the financial sector called for a greater focus on how the transition to low emissions will be financed.

79 Ensuring that public investments support low-emissions outcomes will be a critical part of this. Government project and programme funding must be aligned with climate goals (as discussed in the previous section). Some submitters highlighted the scale of public resource made available as part of the country's COVID-19 response, including significant investments in infrastructure.

80 Public entities and investment vehicles (for example, ACC and the NZ Superfund) also hold significant financial assets. Incorporating low-emissions investment criteria into their investment strategies could have a significant impact. The actions that public entities undertake can affect change in the actions and investments of others, spurring wider change.

81 Mobilising private investment will also be critical. Capital needs to be redirected away from emissions-intensive activities, and finance for low-emissions investments needs to be scaled up.

82 Barriers that currently hinder flows of private capital towards low-emissions investments must be identified and addressed, and ways to incentivise the growth of sustainable capital markets need to be explored.

83 A considerable amount of advice has been developed in Aotearoa and overseas that looks at approaches to changing the way investment and lending decisions are made, to support sustainable finance flows. This includes, for example, the Sustainable Finance Forum's *Roadmap for Action* and work undertaken through the global Network of Central Banks initiative *Network on Greening the Financing System.*

Climate change exposes the financial system to risk and instability

84 Without clear and transparent information about exposure to climate risk, firms, lenders, investors, insurers and other stakeholders may be left with unforeseen liabilities or risks.

85 Internationally, firms are increasingly being required to provide information on the extent of their climate risk exposure and to identify how those risks are being managed – known as climate-related disclosure.

86 Such disclosures generally include information about a firm's exposure to transition risks such as ownership of emissions intensive assets, physical risks from climate impacts, as well as information about how the risks will be managed.

87 Climate-related disclosure gives investors, insurers, consumers and others access to the information they need to make informed choices and avoid exposure to climate risks. It also helps individual entities improve their own understanding of how exposed they are to climate risks.

88 The mandatory climate-related financial disclosures regime recently enacted by the Government is an important step in improving transparency and information about climate risk in Aotearoa. It draws on the recommendations of the Task Force on Climate-related Financial Disclosures, which are considered international best practice for climate-related financial reporting.

89 The ongoing review of this regime will be important to ensure that it remains fit for purpose in the future, and as knowledge about the nature of climate risks evolves. It will also be important to ensure that firms and other entities have the guidance they need to make sure disclosures are consistent, and of good quality.

13.3.3 Support behaviour change

90 Low-emissions technologies, practices and processes can only be effective at reducing emissions if they are adopted and taken up by individuals and businesses. Creating an enabling environment for New Zealanders to make choices that support low-emissions outcomes is therefore critically important.

91 Transitioning to a low-emissions economy will require New Zealanders to change some aspects of their lives. Many people will need to change the type of car they choose to drive, the way they choose to travel, and the way they heat their homes. Many businesses both large and small will need to switch to new processes and ways of doing things. Many farmers will need to change how they manage their land.

92 These changes do not need to be expensive or reduce New Zealanders' quality of life. Many changes will offer immediate and significant co-benefits to health and wellbeing. However, the pace or scale of change needed will not be achieved without first addressing the barriers that prevent the uptake of low-emissions options and approaches.

93 Insights from behavioural economics suggest that adopting new behaviours and technologies can be slow and costly at first but can become cheaper and faster with practice and over time. Once established, initial changes can quickly become embedded into general societal behaviour and form a new status quo.

94 For example, an individual considering a shift to cycling to work will need to consider the initial costs of a bike (including helmet, locks, lights), learning a safe and quick route to work, and finding somewhere safe and convenient to store the bike. However, after this initial investment, it may quickly become a more efficient and preferable way to commute.

95 As the number of cyclists on a particular route increases, social norms around the preferred way to travel may also change. As this example shows, the range of barriers to behaviour change are varied and interconnected. The barriers to changing individual and business behaviour will be different, but understanding and addressing both will be important.

96 The importance of behaviour change emerged as a key theme during consultation, with many submitters focused on the need for measures that support behaviour change – especially in areas where low-emissions alternatives already exist.

97 There were also calls for more research to increase understanding of the most effective ways to influence consumer choice and shift behavioural choices in different sectors. Understanding how to encourage long-term and sustainable behaviour change will require an evaluation of current and past programmes in Aotearoa and internationally to determine what tools to use when, and why.

Education, engagement and information can help shift behaviour

98 Education and information can support behaviour change. Individuals and small businesses, in particular, may not have the time and resources to seek out reliable information. Large-scale change will not occur without widespread communication and access to information. Public engagement is also addressed in Recommendation 10.

99 Specific tactics may involve changing public narratives and perceptions to create a shared positive narrative about climate action. This could help to bolster public support and make behaviour changes more feasible.

100 Public support, even if it starts from a small group, can serve as a tipping point for wider social change creating a positive feedback effect.

101 To shift social norms and promote low-carbon choices it will be important to engage different actors and groups of society, such as businesses, local community groups, and Iwi/Māori. Using community approaches and local knowledge can help to promote and socialise the wide-scale behaviour changes needed.

102 Many submitters used the example of COVID-19 as an example of a successful national effort to engage the public and address a problem, and wanted to see similar efforts to address climate change.

103 Access to information through better data and technology can help people make more informed decisions and support low-emissions practices. Providing clear information through labelling schemes and consumption-based emissions accounting approaches could also help consumers understand the emissions embodied in goods and services, and in the choices they make.

104 However, some submitters were concerned about the tendency to focus on individual behaviour change, rather than the behaviour of business, industry, and central or local government. To accelerate the transition to low emissions, it is important that change happens at both the individual and system level.

105 There have been some efforts by government in Aotearoa to change public behaviour towards low emissions options, notably by the Energy Efficiency and Conservation Authority for energy efficiency outcomes. However, there has not been a systematic effort that involves multiple agencies to coordinate, share best practice and focus efforts on shifting behaviour for climate outcomes.

106 Many of the actions in our advice rely on behaviour change at the individual and organisational level. Government should consider targeted interventions or campaigns for behaviour change in its climate change policies, such as encouraging mode shift in transport, energy efficiency measures, and reducing waste generation.

107 Any behaviour change programmes should be monitored and evaluated against specified outcomes and be supported by evidence and research.

108 Understanding public attitudes could also help to identify opportunities for change, so interventions are targeted to the most receptive audience and could be more effective. It is also important to support early movers and share good practice, so that individuals and organisations can see that behavioural shifts are possible and desirable.

Recommendation 13

Enable system-level change through innovation, finance and behaviour change

We recommend that, in the first emissions reduction plan, the Government commit to:

Enabling system-level change in Aotearoa through innovation, finance and behaviour change

This should include:

1. Accelerating the transition through innovation by:
   a. Giving high priority to low-emissions research, development and innovation within public science and innovation funding approaches. This should include support for research, development and innovation that draws on mātauranga Māori.
   b. Introducing targeted measures to support low-emissions research, development and innovation. This could include tax incentives, research grants and intellectual property regulations, and must include mechanisms to enable Māori-collectives and researchers to equitably benefit.
   c. Creating an enabling regulatory environment for new and emerging low-emissions industries and sectors, including removing barriers for Iwi/Māori to participate in these opportunities.
2. Mobilising finance for low emissions and climate-resilient investments:
   a. Investigating and developing actions government can take to help mobilise private sector finance, including ways to improve access to low-emissions finance for Māori-collectives.
   b. Exploring the extension of the mandatory climate-related disclosure regime to cover a broader range of activities, for example, public entities at the national and local level.
   c. Evaluating the benefits of extending mandatory climate-related disclosure to cover emissions enabled by loans, from financial institutions, over a certain threshold.
3. Supporting behaviour change:
   a. Including behaviour change in the design of climate change policies and programmes, in order to enable New Zealanders to make choices that support low-emissions outcomes.
   b. Identifying a lead agency and establishing a dedicated, well-resourced fund for education and information to promote and socialise the wide-scale behaviour changes needed. This should involve communities, Iwi/Māori and local knowledge.

13.4 Increase the circularity of the economy

109 Transitioning from a relatively linear economy to a more circular economy has the potential to reduce emissions across the economy and generate numerous social, environmental and economic co-benefits. Increasing circularity reflects a consumption based perspective to reducing emissions – see *Chapter 10: rules for measuring progress towards emissions budgets and 2050 targets*.

110 In a linear economy resources are used in a straightforward process from extraction, to production, to consumption, and then to disposal. A circular economy is one where products are designed to last as long as possible, with products and materials recovered and reused at the end of each service life.

111 A circular economy is based on three principles:

- Designing out waste and pollution
- Keeping products and materials in use
- Regenerating natural systems

112 The concept of a circular economy encompasses both biological and technical cycles. The biological cycle is about directly displacing fossil fuels with renewable biological resources. This is primarily addressed in Section 13.5.

113 The technical cycle is about recovering and restoring products, components and materials – including those from non-biological resources. This is primarily the focus of this section.

114 A clear plan and vision for a more circular economy, supported by good data collection and methods to measure circularity, could help assess the scale of potential emissions reductions. However a more circular economy would be more resource efficient, change consumption behaviours to be more sustainable and would likely lead to significant emissions reductions.

115 Waste is a common end point for many products in the linear economy but would play only a minor role in a fully circular economy.

116 Moving to a more circular economy aligns with a te ao Māori view that recognises the relationships across the whole system. Incorporating mātauranga Māori from the outset would provide access to tikanga and kaitiaki practices that already emulate a circular economy. It would also help Aotearoa embed Te Tiriti principles into the evolving fabric of the economy.

117 An Aotearoa specific approach is needed, although we can draw on international examples.

118 For example, the Netherlands have set a goal for achieving a completely circular economy by 2050, and are supporting this through public sector circular procurement, budget funding for circular projects, and publishing a progress report every two years.

119 Other examples include the European Commission, which has a circular economy action plan as a key component of the 'European Green Deal'. This is tracked through a circular economy monitoring report. China also adopted the Circular Economy Promotion Law in 2009 and enacted this with preferential policies for scavenger and decomposer companies and green labelling of recycled products.

Box 13.2: What a more circular economy could look like – a building sector example

The construction sector already contains circular economy elements. For instance:

- In Auckland, gypsum is extracted from construction waste and used as agricultural and horticultural products.
- Golden Bay Cement has begun to use 'tyre derived fuel' – chipped or shredded used tyres. This has the dual benefit of reducing emissions by displacing coal use and consuming a waste product otherwise disposed of in landfills or dumped.
- Most steel is repurposed at the end of life. In Aotearoa, this is largely exported for recycling overseas.

However, there are greater opportunities to increase the circularity of the construction sector. Reducing building waste by moving to more efficient processes will prevent wood and construction waste going to landfill, therefore preventing the emissions from landfill.
Reusing construction materials will also reduce the associated emissions from extracting new materials from forests, processing it into building material and transporting it from manufacturers to the construction site.

13.4.1 The Government needs a long-term circular economy strategy

120 A clear, integrated long-term strategy would help identify cross-sector enabling regulations and investments that would be required to move towards a more circular economy. Clear governance structures would need to be established as part of this.

121 A long-term strategy would provide a roadmap to help businesses, communities and households understand what a future circular economy would look like, and support them to take action.

122 The strategy would need to include measureable indicators, which are yet to be developed for the Aotearoa context.

123 Gathering better data across the waste sector would be a useful starting point for developing a better understanding of the circularity of the economy, and where the biggest emissions reductions can be achieved.

124 Thought also needs to be given to how resources would flow between a more circular Aotearoa economy and other economies internationally. Aotearoa has a limited economy of scale, and interacting with other economies taking circular approaches can increase efficiencies.

125 Moving towards a more circular economy should be aligned with other sectoral strategies such as the Bioeconomy Strategy, National Energy Strategy, Industry Transformation Plans, New Zealand Waste Strategy and equitable transitions planning.

Recommendation 14

Increase the circularity of the economy

We recommend that, in the first emissions reduction plan, the Government commit to:

Developing and delivering a long-term strategy to move Aotearoa to a more circular economy.

This should include:

1. Acting in partnership: To be enduring, the strategy must be created in partnership with Iwi/Māori, give effect to the principles of Te Tiriti o Waitangi/The Treaty of Waitangi, and align with the He Ara Waiora framework. Consideration should also be given to:
   a. How to embed a complementary mātauranga Māori approach in the strategy (see also Recommendation 26 on equitable and proactive partnership with Iwi/Māori).
   b. Enabling Māori-collectives to participate in associated business opportunities.
2. Prioritising and investing in data collection to support measurable indicators to enable monitoring of progress towards circularity and the impact on emissions.
3. Providing a clear governance structure, including tasking a minister and lead agency to assess and implement actions for a more circular economy.
4. Setting up a mechanism that enables active collaboration with Iwi/Māori, local government and industry.

13.5 Develop a thriving, climate-resilient bioeconomy that delivers emissions reductions

126 The 'bioeconomy' refers broadly to the parts of the economy that use renewable biological resources (biomass) to produce food, products and energy. When it incorporates circular economy principles, a bioeconomy can use biomass residues or waste from forestry, fisheries, agriculture and households as raw materials to produce other products.

127 A thriving bioeconomy in Aotearoa could deliver emissions reductions by decarbonising energy sources, replacing fossil fuel-derived materials in supply chains, increasing the carbon stored in long-lived products, and reducing waste. It would also provide significant regional employment opportunities.

128 For example, used cooking oil, crop residues and woody biomass can be used to produce bioenergy. When lower-emissions bioeconomy products displace materials or energy derived from fossil fuels, emissions are reduced.

129 There are several challenges to creating a thriving, climate-resilient bioeconomy that delivers emissions reductions. Many sectors are involved, which can have different priorities and are managed by different agencies who are accountable to several Ministers.

130 Developing a bioeconomy involves transforming and integrating supply chains. While the current resource available to support a bioeconomy that displaces fossil fuels is large, it is still limited, and there are data gaps that prevent efficient matching of regional supply and demand. We heard during consultation that the limited coordination at a central government level is currently a major barrier.

131 While the current resource available to support a bioeconomy that displaces fossil fuels is large, it is still limited, and there are data gaps that prevent efficient matching of regional supply and demand.

132 There are also alternative uses of some available residues, such as forest harvest residues providing nutrients for subsequent rotations, which need to be considered. Other land uses, particularly food production, also compete for land that could be used to create biomass.

133 Our analysis to determine the budget levels has not involved assuming any land-use change to dedicated biomass crops. However, bioenergy could complement some current land uses.

134 We heard mixed views on the scale of the resource during consultation. Some industry submitters believe bioenergy sources are underutilised and underdeveloped, while others worry there will not be enough bioenergy to meet our needs.

13.5.1 The Government needs a bioeconomy strategy

135 To realise the emissions reductions potential of the bioeconomy, the Government should develop and deliver a strategy.

136 To address tensions and diverging priorities across sectors, the strategy will need to lay out a clear governance structure, including clearly identifying a lead agency and Minister.

137 The strategy should be developed in partnership with Iwi/Māori, including with tangata whenua and kaitiaki that have significant interests in assets that will contribute to a bioeconomy. The strategy would benefit from tikanga-based values that emphasise intergenerational wellbeing. It will also need to draw on international best practice.

138 In the short term, publishing data on existing biomass supply and demand would enable industry to develop new regional supply chains. The Government should also assess the emissions reduction potential of existing biomass, and introduce regulatory settings to target this resource towards the hardest-to-abate sectors.

139 In the longer term, the strategy should evaluate the future value of the bioeconomy, with a view to stimulating areas with the most potential to reduce emissions and generate economic opportunity. The strategy should include a package of policies to create effective settings for attracting investment into the sector.

140 This could include, for example, grants, tax credits, or regulation, as well as measures to support the development of regional hubs to support resilience and measures for monitoring the supply, use and demand of biomass residues. Supportive procurement and building policies would also have flow-on effects to support production and use of greater biomass residues.

141 The bioeconomy strategy should be developed alongside the National Energy Strategy and closely linked to Industry Transformation Plans, the revised New Zealand Waste Strategy, Circular Economy Strategy, and equitable transitions planning.

142 It will also be important to ensure the strategy considers and monitors how the development of a bioeconomy impacts carbon stored in forests and wood products.

Recommendation 15

Develop a thriving, climate-resilient bioeconomy that delivers emissions reductions

We recommend that, in the first emissions reduction plan, the Government commit to:

Developing and delivering a strategy for a thriving, climate-resilient bioeconomy that reduces emissions through displacing fossil fuel-derived production materials and energy sources.

This should include:

1. Acting in partnership: To be enduring, the strategy must be created in partnership with Iwi/Māori, give effect to the principles of Te Tiriti o Waitangi/The Treaty of Waitangi, and align with the He Ara Waiora framework. Consideration should also be given to:
   a. How to embed a complementary mātauranga Māori approach in the strategy (see also Recommendation 26 on an equitable and proactive partnership with Iwi/Māori).
   b. Enabling Māori-collectives to participate in associated business opportunities
2. Providing a clear governance structure, including tasking a Minister and lead agency to assess and address competing interests and trade-offs within and across the sectors involved in the bioeconomy.
3. Setting up a mechanism that enables active collaboration with Iwi/Māori, local government and industry.
4. Integrating considerations across the agriculture, building, energy, forestry, land, transport, and waste sectors (see relevant sector recommendations) including:
   a. Collating and publishing data on existing biomass resource supply and demand to identify potential regional supply chains.
   b. Introducing regulatory or investment settings that prioritise high value and emissions reduction uses for biomass resources.
   c. Evaluating the future value of the bioeconomy including as a source of fuels, construction materials, other products, employment and economic opportunity.
   d. Creating an environment that enables research and innovation to drive a valuable future bioeconomy (consistent with Recommendation 13 on innovation, finance, and behaviour change).

13.6 Enable emissions reductions through changes to urban form, function and development

143 The way cities and towns are designed affects emissions from land use, transport, buildings, energy and waste. It also affects exposure of communities and businesses to climate risk. Changes to urban form can play a role in the response to climate change, and have the potential to unlock deeper emissions reductions over the long term.

144 Urban form refers to the physical characteristics that make up urban areas, including the shape, size, density, activities and configuration of settlements.

145 Emissions are generated throughout the lifecycle of infrastructure and buildings in urban environments. This includes emissions embodied in the materials and processes used to produce them, emissions generated through their operation and use, and emissions created as they are maintained and disposed of.

146 Emissions will vary depending on the type and location of buildings and infrastructure – for example, how dense and accessible urban communities are, and what type of transport infrastructure residents have access to.

147 The importance of urban form was emphasised in many submissions during consultation. This included submissions from the building and construction sector, local government, NGOs, academia and individuals who called for more action to reduce emissions from the built environment, and changes to urban form to reduce transport emissions.

13.6.1 Well-integrated policy and planning will be important

148 Development has a long lead time, and buildings and infrastructure have long lifetimes. Urban form and function need to consider planning for future renewable energy infrastructure, intensification, afforestation and changes in transport networks, among other things.

149 Some submitters wanted a more integrated approach to land and transport planning, and highlighted the importance of clear national direction to support and empower local governments.

150 It will be important to make sure energy, three waters, and digital infrastructure can accommodate increased demand. Urban form also needs to support the shift to different types of low-emissions transport, and ensure accessibility and connectivity within and across communities.

151 It will also be important for urban planning and design to weave mātauranga Māori into the decision-making framework to increase understanding of the impacts of urban form on Iwi/Māori communities, including their taonga tuku iho, whenua, te taiao and tikanga.

152 Achieving these outcomes will require well-integrated policy and planning. Urban development requires collaboration across many actors and alignment across multiple pieces of legislation, some of which are in the process of being amended – such as the Resource Management Act (RMA).

153 Local government efforts are underway to implement policy direction under the National Policy Statement on Urban Development and to renew long-term plans. The Government should support these ongoing efforts.

154 The Government should ensure that the reform of the resource management system enables low emissions transport, land use, infrastructure and building systems. This includes supporting the development of regional spatial strategies under the proposed Spatial Planning Act and mandatory national direction for climate change mitigation and adaptation under the proposed Natural and Built Environments Act.

155 Weak national direction and lack of prioritisation of different objectives can make it difficult for local governments to plan accordingly. This can also make it difficult to ensure accountability and joined up thinking around climate change outcomes, particularly when assessed against other social and economic outcomes.

156 Lack of legislative alignment across different levels of government can also make it difficult for developers to build in a cost-effective and timely way. The complexity of the consent process has been examined in the review of the RMA.

Retrofitting existing communities, and constructing new developments pose different challenges

157 As the population and economy grow, urban areas grow to meet housing and infrastructure needs. How urban expansion takes place, where and what gets built, and how it is built will lock in emissions for a long time and create further path dependencies for development.

158 Cities can 'grow out' (construction at the edge of the city), 'grow up' (more intensive development within established areas), or both. In Aotearoa cities tend to grow out, which results in populations living farther from the city centre. The challenges and opportunities of each are different.

159 For existing urban areas, current spaces and infrastructure can be retrofitted to make it preferable to use active and public transport and make other low-emissions choices.

160 This could involve, for example, reallocating street space away from cars, creating low- or no-emissions zones, or piloting '15-minute cities'. The 15-minute city is a residential urban concept in which all city residents can meet most of their needs within a short walk or bicycle ride from their homes. Increasing density also encourages use of existing land and infrastructure.

161 However, there are considerable challenges associated with retrofitting urban areas, buildings and infrastructure that have not been designed with low-emissions outcomes in mind.

162 In contrast, new developments offer significant opportunities. These communities can be designed in a way that avoids locking in emissions for decades to come if services, amenities, facilities and infrastructure are provided for at the planning stage. These need to accessible and interconnected, including via safe cycle and walkways and connections to public transport.

Changes to urban form and function can bring other benefits

163 Good urban design is important for reducing emissions over the long term at a systems level. It also brings many other health, environmental and wellbeing benefits. This includes reduced air and noise pollution, increased levels of physical activity, reduced congestion, better connected communities and improved safety.

164 Urban design also affects accessibility and mobility. The design and layout of buildings, transport networks and public spaces must accommodate diverse needs to provide more equitable and inclusive access to city spaces and amenities, buildings, infrastructure and transport systems.

165 Accessible urban spaces can also support people to 'age in place', which in turn supports mental and physical health, along with other benefits for wellbeing.

13.6.2 A robust and consistent approach to quantifying emissions from urban form is needed

166 There have been many studies on the impact urban form, density, mobility, land use and planning approaches have on emissions. However, there is limited evidence available on the relationship between these factors, particularly for Aotearoa circumstances.

167 The variation in urban form can make it difficult to quantify the effects of different strategies to support climate outcomes. The range of different emissions sources affected by the ways towns and cities are designed can also make it difficult to coordinate planning and investments, and to ensure decision making is focused on clear outcomes.

168 Further investigation is needed to develop a robust and consistent methodology for quantifying how different aspects of urban design affect emissions. This will also help to develop a comprehensive Aotearoa-specific evidence base. Together, these should inform how approaches to reducing emissions from cities and towns, transport networks and buildings are designed.

169 Collaborative processes to integrate mātauranga Māori into modelling, quantitative assessments and planning phases will also be important to help ensure urban design solutions acknowledge Iwi/Māori whakapapa, identity and tūrangawaewae, and the need to preserve and protect their wāhi tapū and sites of cultural significance.

170 Improving our understanding of the impact of urban form on emissions is a matter of urgency, because reducing emissions through the design of towns and cities depends on decisions that are made today.

171 Once investments are made there is little scope for revisiting earlier decisions. This means that in the face of continued uncertainty and lack of national direction, building, infrastructure and transport emissions continue to be locked in. The scale can be significant, particularly for large commercial buildings or suburban developments.

Recommendation 16

Enable emissions reductions through changes to urban form, function and development

We recommend that, in the first emissions reduction plan, the Government commit to:

Enabling emissions reductions through changes to urban form, function and development.

This should include:

1. Developing a policy approach in partnership with Iwi/Māori to ensure well-integrated planning and policies related to urban form, function and development. This approach must also be developed in active collaboration with local councils and communities.
2. Promoting urban design solutions that acknowledge Iwi/Māori whakapapa, identity and tūrangawaewae and the need to preserve and protect their wāhi tapū and sites of cultural significance.
3. Developing a consistent approach to quantifying the emissions impacts of urban development decisions. Use this to continually improve the way emissions consequences are integrated into decision making on land use, transport and infrastructure investments.
4. Improving the evidence base on the relationship between urban form, function, density, transport systems, land use and other factors. This will support the design of approaches to reduce emissions across different urban areas.

For existing urban areas:

5. Retrofitting existing public spaces and infrastructure to prioritise the use of active and public transport and other low emissions choices. This recommendation should be considered alongside Recommendation 17 for transport and Recommendation 13 for behaviour change.
6. Ensuring regulatory settings allow for increased density and use of existing infrastructure, land and built form to reduce emissions.

For new urban areas:

7. Enabling low emissions choices by ensuring services, amenities, facilities and infrastructure are accessible and interconnected. This includes providing safe cycle and walkways and connections to public transport.

Assessment of our recommendations against our policy approach

Recommendations 11-16	Action to address barriers	Pricing to influence investment & choices	Enable innovation & system transformation
Multisector strategy			
Update and improve the NZ ETS		✓	
Make investments net zero compatible		✓	✓
Enable system change through innovation, finance and behaviour change	✓		✓
Increase the circularity of the economy	✓	✓	✓
Develop a strategy for a thriving, climate-resilient, low emissions bioeconomy	✓		✓
Enable emissions reductions from urban form	✓		✓