Canterbury Climate Partnership Plan

Action 2: Emissions Reduction Strategic Overview

It's time, Canterbury
Our climate change conversation

CANTERBURY
Mayoral Forum

Contents

Executive summary

Purpose of the Overview

This Strategic Overview (the Overview) brings together what we know about greenhouse gas emissions in Canterbury – our region's emissions profile; the emissions reduction efforts already under way by central government, local government, iwi and mana whenua, and industry; the key actors; the range of international influences that may impact the nature and speed of our own transition; some of the most significant transition challenges, opportunities and potential council interventions; and climate funding and financing considerations. Bringing all this information together identifies the range of opportunities to reduce emissions in Canterbury and lays the groundwork for developing a regional low-emissions transition plan.

Context

The Overview is a first-stage deliverable of a key action (Action 2) in the Canterbury Climate Partnership Plan: *to work together across the region to build equitable, inclusive pathways, targets, and key actions to support New Zealand's commitments towards global greenhouse gas emissions reduction.* The action will ultimately produce a regional low-emissions transition plan and lay out a roadmap Canterbury councils can use to work with residents to most effectively reduce emissions at a local level.

The Overview is a key foundational document for this project, identifying a range of transition opportunities for Canterbury that could support the transition. The Overview is not intended to endorse the identified opportunities (or council interventions) at this stage for inclusion in the transition plan, but simply recognises that they should be investigated further in stage 2 of the project. This second stage will see a transition risks and opportunities assessment completed, which will focus on the social, cultural, environmental, and economic impacts of the opportunities, as well as undertake emissions pathway modelling for the region.

Methodology

The Overview was completed through desktop research and literature reviews of publicly available sources, central and local government documents, academic articles and council internal documents. Case studies were also undertaken at two South Canterbury businesses to support the information on current initiatives across the region.

The research provides a broad picture of emissions and reduction challenges and opportunities in Canterbury. The opportunities cover those at both the systems-level and sector-specific to provide a more complete picture. Council intervention options identified are aligned with the current purpose of local government in the Local Government Act 2002, as well as the role of councils in preparing for, and adapting to, climate change under the current Resource Management Act 1991.

Key findings from the Overview:

- there are a wide range of emissions reduction initiatives already happening across Canterbury by industry, central and local government, iwi and mana whenua; however a number of the highest emitters in the region are yet to commit to or implement emissions reduction actions
- there are some significant barriers and risks in transitioning; often these relate to incentives, the ability or willingness to invest in or access new technologies, or the ability to meet regulatory requirements
- there are a range of opportunities both at the system level and in each emitting sector that exist to increase the speed and success of transitioning, and many of these include numerous actors and sectors
- Canterbury's councils are at differing stages in supporting community emissions reduction, and those that are further ahead can provide learnings for the rest
- councils can support, lead or collaborate with other actors to achieve reductions across each of the sectors, particularly in transport and waste, and play a key role in behaviour change across the emissions reduction spectrum
- EECA's Regional Energy Transition Accelerator programme has been key in supporting process heat users to transition and supporting light and heavy vehicle fleet changes
- the transition to low emissions will affect urban and rural communities differently, and this is impacting the speed and nature of the transition in the agricultural sector especially
- there is less of a focus on emissions reduction at a central government level than previously – this impacts funding and financing streams, as well as the speed of the transition as a whole
- international influences, most notably technological innovations, international policy changes, and consumer expectations, will all continue to have an impact on the speed and nature of the transition in New Zealand
- there are various financing and funding options for councils, communities and industry. For councils, implementing a climate levy and utilising LGFA climate loans remain key options to consider for both infrastructure and non-infrastructure mitigation initiatives, alongside ensuring councils have appropriate consenting and planning frameworks to enable industry-led mitigation projects to proceed. Aligning initiatives or projects with government priorities is likely to assist in accessing the available opportunities, as may investigating co-financing or co-funding (rather than fully financing or funding) some mutually beneficial initiatives with the community, businesses, research organisations and universities, as well as overseas investors.

Opportunities and potential council interventions

Sector-specific, cross-sector and systems level opportunities identified in the Overview are set out in the tables below, alongside potential council interventions and the actors that should be involved. The key opportunities from the tables are summarised in the list below. Greater detail on each of these, along with the associated barriers and risks, is found across chapters 4-7.

Cross-sector and systems level key opportunities:

- improved connections between local and central government

- increased partnerships between local government and mana whenua
- orienting planning and consenting processes so they enable the adoption of low-emissions technology and infrastructure, and enable sustainable living
- reducing emissions at source through behaviour change – particularly in the energy, transport and waste sectors
- implementing a circular economy to reduce emissions across all sectors
- improved range of, and accessibility to, finance and funding streams for low-emission initiatives for local government, iwi and mana whenua, communities and industry
- electrification of all sectors (and support for related renewable energy options, such as biomass and biogas)
- improved methane capture management in the waste and agriculture sectors
- support industry to prepare for the skills needed in each sector for a low-emissions future.

Agriculture, forestry and land use key opportunities:

- support uptake of already-available tools, technologies and practices to reduce agricultural emissions, and support innovation in methane inhibitor research and practice
- review Good Management Practices to consider how greenhouse gas emissions reduction could be included
- promote use of Mātauranga Māori in the development of low-emissions solutions
- improve carbon sequestration through appropriate afforestation and restoration of wetlands and indigenous biodiversity.

Energy key opportunities:

- support the development of an energy strategy/action plan for the region already under way by the Mayoral Forum
- improve energy efficiency in (new and existing) homes and buildings
- improve availability of biomass and related alternatives
- stronger advocacy to government on key energy issues that support a low-emissions transition
- greater investment in innovation (focusing on grid decarbonisation and energy efficiency)
- consider how local energy area planning can support communities to plan for and switch to renewable energy.

Transport key opportunities:

- support the actions in regional transport planning documents that reduce emissions, such as greater public and active transport and moving freight to coastal shipping and rail
- undertake behaviour change campaigns to enable mode shift and greater uptake of low-emission options for light and heavy vehicles, in both urban and rural settings
- improve transport infrastructure – enable increased EV charging, infrastructure required to move freight from roads to rail and coastal shipping (and decarbonisation of ports and airports), and support a mass rapid transit system for Greater Christchurch
- enable, advocate for and promote greater use of technology that supports reduced transport emissions (freight as well as public and private transport)
- explore feasibility of public transport systems for smaller urban areas, and/or increased support for community vehicle trusts in smaller urban and rural communities
- explore feasibility of a blue and/or green hydrogen industry in Canterbury.

Waste key opportunities

- support the Canterbury Waste Joint Committee to develop a regional approach to waste
- foster a circular economy approach to waste, focusing on waste avoidance and energy capture and recovery from waste

Industrial processes and product use key opportunities:

- promote product stewardship and take-back schemes
- consider how regulatory levers and greater sharing of information could be used to promote reduced emissions.

As well as the opportunities discussed in the Overview, there are also likely to be further low-emissions transition opportunities identified in the coming 12 months as other Partnership Plan actions progress. This could include:

- Action 4.2 - developing a blue-green network (as far as it relates to reducing net emissions through carbon sequestration)
- Action 6.2 - supporting councils to work in partnership with Papatipu Rūnanga to integrate their requirements into local climate action planning
- Action 8 – developing effective climate funding and financing structures.

The development of Environment Canterbury's planned air strategy and integrated Regional Plan may also identify additional emissions reduction opportunities. The Government's resource management and local government reforms could also influence the opportunities and levers that councils have to provide low-emission interventions.

Next steps

The opportunities identified in the Overview will undergo a deeper assessment in the next stage of the project, which will consider the environmental, economic, social and cultural impacts of the opportunities. To ensure an equity lens is applied, there will be a focus on the impacts on traditionally underserved communities in the region, with a particular focus on iwi/Māori, rural and remote communities, and low-income communities.

Cross-sector/system-level opportunities

Opportunity	Related council intervention(s)	Impact/benefits	Key actors involved
Improved connections with central government	Prioritise building closer relationships with central government at a governance, chief executive and senior leader level	Improved ability to successfully advocate for and influence national low-emissions policy settings to ensure these are delivered in an inclusive and equitable way for Canterbury's industries and communities	Ministers, relevant government department and agency chief executives and senior policy staff Canterbury Mayoral, Chief Executives and Policy Forums
Increased partnerships with mana whenua	Create partnerships with mana whenua to support reductions initiatives already under way or planned, as well as the restoration or creation of native planting, wetlands and forests to increase carbon sequestration and restore indigenous biodiversity in the region	Better use of local knowledge to reduce emissions, and improve carbon sequestration and indigenous biodiversity.	Te Rūnanga o Ngāi Tahu Mana whenua Councils
Improved connections with universities and research and science organisations	Build on current connections with university and research, science and innovation organisations	Local government will be better prepared to promote new research and tools to industry and the public, and support efforts to incentivise global investment in establishing national and regional markets for new tools and technologies	Councils/Economic Development Agencies Canterbury and Lincoln Universities Te Pūkenga (Canterbury) Lincoln-based Crown Research Institutes/Public Research Organisations
Planning and consenting processes	Ensure planning and consenting processes enable the adoption of low-emissions technology and infrastructure, and enable sustainable living	Reduction of barriers to adopting low- emission solutions for industry.	Councils MfE

	The Regional Policy Statement review is a key opportunity to ensure planning support for the transition, while considering how to provide support and information to applicants at the pre-application stage is key for consenting processes Collaborate across the region to ensure councils are prepared for implementing government-led changes to the resource management system		
Behaviour change	Undertake greater behaviour change campaigns across the region, focusing on energy efficiency, transport and waste. Consider investing as a region, alongside the government, in supporting initiatives that incentivise or make it easier for people to change their behaviour.	Households and businesses reducing their emissions at source will contribute to reduction targets across various sectors	Councils MBIE Ministry of Transport/NZTA EECA
Accessibility to advice and finance and funding streams	Consider restructuring council investment priorities, developing income streams and engaging with private investors (both domestic and international) to facilitate the economic packages needed for the transition.	Improved levels of investment in science, research and development, development of infrastructure, education and skilled labour, and higher quality consent applications. Improved awareness of, and access to, the range of advice and support that is already available	Councils MBIE MPI EECA

	Councils can also promote the range of advice, funding and finance available for businesses and communities to transition Consider how councils can financially support industry and community initiatives alongside government – investigate options like a climate levy, or expanding current funds or subsidies so they are accessible to a wider audience	Greater access to funding for transition activities for community groups, households, and business	
Information-sharing	Improve the supply and communication of accurate information to enable communities and business to make sustainable choices	Assist industry and communities to access relevant and timely advice, funding, research and solutions at a local, regional and national level	Councils MBIE MPI EECA Business Canterbury South Canterbury Chamber of Commerce
Skills	Support industry to develop a low-emissions skills map to help understand the step changes needed for a successful transition in the region	The technology and operational changes required in all emitting sectors will be supported by skilled labour.	Councils MBIE MPI EECA Business Canterbury South Canterbury Chamber of Commerce
Circular economy	Focus on waste avoidance, and support the Canterbury Waste Joint Committee's intention to develop a regional waste strategy that facilitates a circular economy approach across the region	A circular economy approach to waste, materials and resources is key to resolving waste emissions and help stimulate changes in industry and behaviour change around consumption choices and disposal activities. A circular economy can promote new industries, providing employment and skills opportunities.	Councils Canterbury Waste Joint Committee Transwaste Canterbury EnviroNZ Mana whenua

GHG emissions data collection and management	Work with government and industry to improve emissions data collection and management, with a focus on agriculture and waste-related greenhouse gas emissions	Improved baselines, benchmarks and progress can be established and tracked, supporting councils and industry to make better decisions about emissions reduction	Councils MPI MfE EECA Agriculture industry organisations Transwaste Canterbury Canterbury Waste Joint Committee EnviroNZ WasteMINZ Climate Change Commission
Electrification	Co-invest with industry and central government on infrastructure changes and work with energy suppliers to develop grid capacity. Support energy users to make well-informed decisions about sustainable energy choices Alongside electrification, increase availability and uptake of other renewable energy options, such as biomass and biogas	Further electrification of the grid and development of grid capacity for increased power will: • allow for industries to divest from fossil fuel heating, like that required for meat and dairy manufacturing • stimulate an increase in personal electric vehicle uptake, through the presence of more electric vehicle charging infrastructure • enable bus electric fleet uptake through the capacity to provide high-capacity charging infrastructure • enable increased uptake of light and heavy EV vehicles for freight • introduction of future technologies including the advancements in clean hydrogen production or carbon capture and storage. • support waste facilities, construction projects, commercial buildings to reduce their scope 1 & 2 emissions.	Councils MBIE EECA Power companies and distributors Transpower Electricity Authority Business NZ Energy Council Rewiring Aotearoa Process heat users Freight companies Infrastructure services companies Tāwhaki National Aerospace Centre Canterbury and Lincoln Universities Lyttelton Port and PrimePort Christchurch International Airport Ngāi Tahu Mana whenua Climate Change Commission

Methane capture management	Work with the pastoral, manufacturing and waste sector to understand the potential for technology adoption to improve methane capture management and identify funding or financing schemes to support this	Improved methane capture to produce energy. Potential direct energy application (through burning) include: • landfill sites adopting methane capture technologies for energy recovery. • anaerobic digesters to collect and process organic waste, which would also reduce methane at landfills – so an understanding of transition impacts is needed across the waste sector. • agricultural systems could also capture methane from manure in slurry pits. Methane captured and processed for: • biogas to be used as bioLPG or industrial activities, • biofuels in vehicles or home energy and heating, or • creation of hydrogen fuels.	MfE MPI Transwaste Canterbury EnviroNZ WasteMINZ Ecogas Federated Farmers Beef + Lamb AgResearch Ngāi Tahu Canterbury Waste Joint Committee
District-level emissions reduction plans	Consider whether some districts in Canterbury could benefit from the development of a localised emissions reduction plan following the completion of the regional transition plan	The regional transition plan will provide a roadmap for councils to work with their local communities on emissions reductions. A detailed, local approach in some districts could allow for a more equitable and inclusive transition at the community level, and ensure mana whenua are supported in their climate aspirations. Some councils are considering undertaking these already.	Councils Iwi and mana whenua Industry Business Canterbury South Canterbury Chamber of Commerce

Sector-specific opportunities

AGRICULTURE, FORESTRY AND LAND USE

Opportunity	Council interventions	Impact/benefits	Key actors involved
Review Good Management Practices guidelines to consider how they could include management of greenhouse gas emissions	Lead a review of the guidelines alongside industry and Crown Research Institutes/Public Research Organisations.	A regionally consistent and collaborative approach to reducing on-farm emissions.	Councils Agricultural businesses AgResearch, Scion, Manaaki Whenua, Plant & Food Research Farming industry associations MPI MBIE Ngāi Tahu
Support uptake of already-available tools and technology	Proactively develop and provide advice, or share available information and guidance, on the availability of tools and technology (including precision agriculture), available farm advisory services, and the range of grants, subsidies, and other funds that could be available to farming operators to support change. Support the sector to map out agricultural systems in the region to help steer a balanced network of cattle farmers and farms that can grow crops that support the feedstock. Promote available tools to improve emissions data collection at source.	An increased level of awareness and uptake of existing low-emissions tools and technologies.	Councils AgResearch, Scion, Manaaki Whenua, Plant & Food Research Farming industry associations Agricultural businesses MPI MBIE Ngāi Tahu
Drive innovation in methane inhibitor research and practice	Support, or identify partnership opportunities, with industry, government and research organisations to speed up vaccine and inhibitor development.	Use of methane vaccines and inhibitors will significantly reduce methane emissions on farm.	AgriZero NZ Councils Agricultural businesses

			AgResearch, Scion, Manaaki Whenua, Plant & Food Research Lincoln University Farming industry associations MPI MBIE Ngāi Tahu
Education and skills development	Partner with tertiary education providers to support better entry into pastoral sector careers by understanding what core skills will be needed in the sector, how these can be developed internally or attracted externally.	The region is prepared for the skills that will be needed during and after the transition.	Councils Economic Development Agencies MPI MBIE Tertiary education providers
Promote mātauranga Māori	Facilitate or coordinate collaborative efforts within the sector to promote mātauranga Māori in the development of low-emissions solutions.	Improved environmental outcomes and socio-economic benefits for communities.	Ngāi Tahu Mana whenua Councils Crown Research Institutes/Public Research Organisations MPI AgriZero NZ
Offsetting through carbon sequestration	Support government targets for offsetting in the second Emissions Reduction Plan by working with industry and central government to identify where and how to increase afforestation in the region, as well as restoration of wetlands and indigenous biodiversity	Contributes to net emission targets.	MPI Scion Ngāi Tahu Mana whenua Councils

ENERGY

Opportunity	Council interventions	Impact/benefits	Key actors involved
Regional approach to energy matters	Support the outcomes of the Mayoral Forum's energy inventory project	Provides a consistent approach to energy and enables opportunities in energy supply, security and emissions reductions	Councils MBIE EECA Power companies and distributors Transpower Electricity Authority Business NZ Energy Council Process heat users Freight companies Infrastructure services companies Tāwhaki National Aerospace Centre Canterbury and Lincoln Universities Lyttelton Port and PrimePort Christchurch International Airport KiwiRail Ngāi Tahu Mana whenua Climate Change Commission
Improve energy efficiency for homes and buildings	Promote alignment with voluntary energy efficiency certification systems for buildings through advisory, planning and consenting processes. Partner collectively and/or with EECA to increase investment in supporting households to replace older burners or higher-emitting heating and install insulation.	Warmer, dryer homes and businesses. Improved air quality.	Councils EECA MBIE New Zealand Construction Industry Council

	Investigate how councils can promote or financially support the uptake of distributed energy generation, particularly for solar energy, for households and businesses, and promote digital tools or smart monitoring to increase energy efficiency, noting that solutions will be different depending on whether the home or building is new or existing. Work collectively with central government and industry to amend the Building Code to provide greater transparency for new and existing homes on measures to support energy efficiency.		
Improve the availability of biomass and alternatives	Partner with industry to understand and facilitate the increased availability of biomass and alternatives so that process heat users are clear on the costs and implications when making fuel switching decisions.	Provide greater certainty about fuel switching and encourage a faster transition.	MPI Scion Ngāi Tahu Councils
Local area energy planning	Consider how councils can partner with stakeholders to develop local area energy plans, covering energy generation, energy distribution, energy use and energy recovery, for districts or distinct geographical areas.	Localised approaches to renewable energy and reduced energy emissions.	As above for regional approach to energy matters Communities Business Canterbury South Canterbury Chamber of Commerce
Implementation of National Environmental Standard for Greenhouse Gases for Industrial Process Heat	Review planning and consenting processes to ensure the process is efficient for applicants and staff processing consents. Ensure applicants are well-prepared for the consenting process in the pre-application stage. Explore how smaller-scale process heat users can be supported financially to develop emissions reduction plans and other requirements for the consent process.	Significantly reduced process heat emissions. Faster, more efficient consenting processes.	Environment Canterbury Process heat consent holders/applicants EECA MfE

Investment in innovation	Explore with industry how local government can support the transition through investment, approvals processes and guidance for solutions for both small- and large-scale technologies needed, with a focus on grid decarbonisation and energy efficiency.	Improved energy supply and security. Improved energy efficiency at small and large scales.	As above for regional approach to energy matters Business Canterbury South Canterbury Chamber of Commerce
Advocacy to government	Enhanced advocacy to the government on key energy issues, including: • the development of a national energy strategy • energy efficiency improvements in homes and businesses • how carbon is priced • prohibition or phase out of gas appliances.	Greater government support or improved co-funding opportunities for reducing energy emissions.	Councils MBIE Ministers MfE EECA
Skills	Lead or support with industry and/or tertiary institutes an assessment of the gaps in energy decarbonisation skills needed in the region.	Clarity on skills gaps and a clear path to ensuring better uptake of new technologies.	Councils MBIE Canterbury and Lincoln Universities, Ara EECA Business Canterbury South Canterbury Chamber of Commerce
Carbon capture and storage	Share or promote information to industry about carbon capture and storage to prepare for upcoming government-led opportunities.	Supports key policy in the second NZ Emissions Reduction Plan. GHG removal activity.	Councils MfE MBIE Business Canterbury South Canterbury Chamber of Commerce

TRANSPORT

Opportunity	Council interventions	Impact/benefits	Key actors involved
Behaviour change	Support efforts to increase bus patronage in Greater Christchurch through the regional public transport plan. Identify how councils can work together to promote active travel for both urban and rural areas in the region (e.g. investment in road safety and quality, making transport networks safe for e-bikes and scooters, cycleway and footpath safety, cycle infrastructure and pedestrian-friendly areas in towns/cities). Promote the range of funding and financing options already available for industry to decarbonise light and heavy vehicles (through EECA, the Provincial Infrastructure Fund, and others). Support, and where needed facilitate, coordination efforts in the transport (and particularly freight) sector on sustainability and emissions reduction. Consider how to best use regulatory levers to encourage uptake of low-emissions vehicles, such as free parking and access to bus lanes for EVs. Continue to advocate with central government on national policy settings to support behaviour change in Canterbury.	Fewer transport emissions and reduced road congestion Improved health outcomes through more active transport options Greater coordination in the freight sector	Councils EECA Freight (whole of supply chain) NZTA Ministry of Transport Regional Transport Committee
Improve transport infrastructure	Support the Government's goal of 10,000 public EV charging points by 2030 through: • mapping where the need is for charging stations in the region	Enable greater uptake of EVs across the region	Councils KiwiRail Regional Transport Committee Lyttelton Port

	• identifying possible collaborations to facilitate investment in charging infrastructure • considering how charging infrastructure can be facilitated through the consenting process (i.e. inclusion in consent conditions). Promote and support the work of the Regional Transport Committee in enabling freight mode shift to shipping and rail where possible, and support decarbonisation of ports and airports. Support continued advocacy to improve rural connectivity to take advantage of the latest digital innovations.	Reduce road congestion and fuel emissions through more freight on trains and ships. Enable improved uptake of digital technologies in rural and remote areas.	PrimePort Timaru Drive Electric NZTA Ministry of Transport MBIE Infrastructure services companies Electricity distributors and power companies Telecommunications companies
Use of technology	Enable, advocate for or promote greater use of technology that supports emissions reductions – including better rural connectivity for remote working, access to smart travel information to encourage public transport, as well as raise awareness of the benefits of digital innovations for freight and logistics.	Uptake of technology can make it easier to reduce emissions and support related reduction efforts.	Councils MBIE Ministry of Transport Freight companies and industry associations
Increase patronage on public transport	Support the regional public transport plan to concentrate investment on frequent routes, increase service frequency, improve reliability through improved infrastructure, and improve the customer experience.	Reduced road congestion and quicker commute times Reduced emissions from passenger transport.	Councils NZTA Ministry of Transport Regional Transport Committee Greater Christchurch Partnership
Explore feasibility of public transport systems in smaller urban areas in the region	Work collectively to understand where in Canterbury (outside of Greater Christchurch and Timaru) might benefit from a MyWay-type service and/or increased support for Community Vehicle Trusts and the costs to do so.	Increased mobility in smaller towns; reduced emissions from passenger transport.	Councils NZTA Ministry of Transport

Support mass rapid transit system in greater Christchurch	Promote the work of the Greater Christchurch Partnership to progress a mass rapid transit system and support it to seek co-funding or co-investment with central government and/or private investors.	Significantly reduced road emissions, congestion and commute times. Enables a planned approach to urban form, housing, transport and planning for the future of the city.	Councils Greater Christchurch Partnership Regional Transport Committee Ministers of Transport, Local Government Ministry of Transport
Explore feasibility of a blue and/or green hydrogen industry in Canterbury	Lead or support a feasibility study alongside industry and central government.	Biofuels could have an immediate impact on emissions as they can be used in existing vehicles and infrastructure, and as part of the solution for sustainable aviation fuels.	Councils Regional Transport Committee MBIE, MfE, MPI, Ministry of Transport Business Canterbury South Canterbury Chamber of Commerce Economic Development Agencies Christchurch International Airport Ngāi Tahu Mana whenua

WASTE

Opportunity	Council interventions	Impact/benefits	Key actors involved
Support the Canterbury Waste Joint Committee's efforts to develop a strategic, regional approach to waste	Identify the support needed from councils to assist the Committee to develop its planned regional waste strategy. Continue support at the council staff and governance level for the Committee's waste data management project and its outcomes.	A regionally consistent and planned approach to waste matters for the future.	Councils Canterbury Waste Joint Committee
Take action to promote and foster a circular economy approach to waste	Undertake regional campaigns to promote waste avoidance as the primary goal, and advocate to government for funding to scale up efforts to reduce waste (by councils and/or community organisations already working in this area). Promote the waste minimisation grant for projects in the region that seek to avoid waste. Facilitate a regional waste and materials recovery industry based around the principles of repurpose, reuse, refurbish and recycle. Agree a regionally consistent approach to source segregation, with organic waste being a priority due to its production of methane. Take a strategic approach to energy recovery from waste (including landfill gas capture) by understanding the region's needs and demand, feasibility of technologies, and identification of appropriate locations for facilities that can develop energy from waste.	Lower emissions by reducing the amount of waste going to landfill, and better capturing emissions from waste to be used in other processes.	Councils Canterbury Waste Joint Committee Transwaste Canterbury EnviroNZ WasteMINZ

	Review procurement processes and contracts to encourage waste management companies to invest more in infrastructure and assets that improve collection and disposal while reducing emissions (such as AI-enabled data collection, electric or low-emission waste collection trucks).		

INDUSTRIAL PROCESSES AND PRODUCT USE

Opportunity	Council interventions	Impact/benefits	Key actors involved
Build F-gas industry capability and capacity to support non-HFC gas and products	Support a review of business practices in the region to ensure compliance with operating licences and legislation. Work collaboratively with industry to ensure they have the right information to make informed decisions for switching to alternative refrigerant gases.	Improved compliance with regulations and better uptake of alternative gases.	Councils Manufacturers NZ Construction Industry Council MBIE MfE CoolSafe
Greater use of regulatory levers	Collaborate with central government to develop effective building codes and F-gas regulations. Build connections with manufacturers to promote and find ways to support their adoption of low emission alternatives. Consider the feasibility of prohibiting the use of F-gases through planning and consenting levers, and the risks and barriers in doing so.	Improved compliance with regulations and better uptake of alternative gases.	Councils MBIE MfE New Zealand Construction Industry Council Manufacturers
Greater uptake of take-back schemes	Promote CoolSafe's take-back scheme that raises awareness of the correct disposal of F-gases to encourage safer disposal.	F-gases are disposed of in a safe way.	Councils CoolSafe
Product stewardship	Work with central government to understand the Refrigerants Regulated Product Stewardship scheme and how best to support suppliers, installers and disposal sites once implemented.	Supports circular economy and less waste to landfill.	Councils MfE Manufacturers

1 Introduction

mo tātou, ā, mā kā uri a muri ake nei

(for us and our children after us)

Context

Reducing greenhouse gas (GHG) emissions is not only an environmental responsibility but an economic imperative. The financial costs of inaction—ranging from disaster recovery and infrastructure damage to healthcare expenses and productivity losses—continue to escalate as climate impacts intensify. Extreme weather events, supply chain disruptions, and rising insurance premiums place growing burdens on households, businesses, and governments alike. For policymakers, failing to address emissions today risks greater economic instability and costly future interventions.

Reducing emissions not only mitigates climate risks but also delivers significant co-benefits across the four wellbeings — enhancing economic resilience through job creation and cost savings, improving social equity by reducing health disparities, strengthening environmental sustainability by protecting natural ecosystems, and supporting cultural wellbeing by preserving community identity and traditional knowledge in the face of climate change. A proactive approach to emissions reduction is not just about environmental stewardship — it is a necessary strategy for safeguarding our daily lives.

Content

This Strategic Overview (the Overview) provides an overarching narrative of greenhouse gas emissions in Canterbury. It summarises emissions reduction efforts, opportunities and barriers, and lays a foundation for developing a regional low-emissions transition plan.

It covers:

- key information on Canterbury's emissions and emissions profile
- emissions reduction and transition initiatives completed or under way in the region
- key actors and stakeholders, industries, and groups with which councils could partner on emissions reductions
- international influences that could impact the speed of the transition and types of desired emissions reductions in Canterbury
- options for the transition, including the range of barriers, risks, opportunities and possible council interventions across emitting sectors
- options for funding and financing the transition.

Methodology

The Overview was completed through desktop research and literature reviews of publicly available sources, central and local government documents, academic articles and council internal documents. A report was procured from Jacobs New Zealand summarising the options for the transition and the range of potential council interventions that fed into Chapter 7. In addition to desktop research, case studies were also undertaken at two South Canterbury businesses, which included site visits by Timaru District Council staff (see Chapter 4).

The research is high-level in nature to provide a broad picture of emissions, and emission reduction initiatives and opportunities, in Canterbury. The opportunities identified will therefore need to be further assessed in the next stage of the transition plan project as to their feasibility and impacts. Council intervention options discussed are aligned with the current purpose of local government in the Local Government Act 2002, as well as the role of councils in preparing for, and adapting to, climate change under the Resource Management Act 1991.

The Overview was reviewed internally by Canterbury Regional Council staff (as project leads), as well as the Canterbury Climate Change Working Group.

Canterbury Climate Partnership Plan

This Strategic Overview is a deliverable within the first stage of a three-year project in the Canterbury Climate Partnership Plan (the Partnership Plan) to develop a low-emissions transition plan for the region[1].

The project is based on the action in the Plan to **work together across the region to build equitable, inclusive pathways, targets, and key actions to support New Zealand's commitments towards global greenhouse gas emissions reduction.**

It has three sub-actions:

- 1: collate data and develop models to prepare greenhouse gas emissions inventories and identify emissions reduction pathways for Canterbury to support Aotearoa New Zealand's national greenhouse gas commitments.
- 2: based on the emissions reduction pathways identified for Canterbury, undertake a regional transition risk and opportunities assessment, considering social, cultural, environmental, and economic impacts, to inform an equitable and inclusive transition to a low-emissions region.
- 3: work with partners, communities, and key stakeholders to build a regional low-emissions transition strategy that supports equitable, inclusive local pathways to a thriving, climate-resilient region meeting emissions reduction targets.

The Overview sets the scene for all three sub-actions. It provides a key part of the evidence required to undertake sub-actions 2 and 3, and supports the modelling work that will be completed for sub-action 1.

[1] See Action 2 of the Canterbury Climate Partnership Plan - https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf . While the Plan refers to a "transition strategy", during project planning this was amended to "transition plan"

The transition plan that is ultimately developed in sub-action 2.3 will lay out a road map individual councils can use to work with their communities to most effectively reduce emissions at a local level.

As the transition plan will be focused on gross emissions reductions, carbon sequestration (the process of storing carbon in a carbon pool, such as trees or soil[2]) is not covered in depth in this report. However, as it is a key part of the national Emissions Reduction Plan, opportunities for sequestration alongside emissions reduction are referenced for further consideration as the transition plan project progresses.

EQUITY CONSIDERATIONS

The Partnership Plan requires that the transition plan ensures emissions reduction actions are equitable across Canterbury's diverse communities. In this context, equitable means that the impacts of the plan's actions need to take into account their impact on traditionally underserved people or groups in Canterbury and ensure a fair outcome for everyone.

An equity lens will be applied to transition opportunities identified through this Overview during the next stage of the project, so while it is not a key focus in this document, equity is referenced through some of the barriers and risks discussed throughout.

Th equity lens that is applied during the next stage will include consideration of the following key groups within Canterbury:

Iwi and mana whenua

In seeking to be Treaty-based, in line with the values of the Partnership Plan, the strategy that is developed must ensure iwi and Papatipu rūnanga are involved as they wish throughout the transition to a low-emissions future. This aligns with the rangatiratanga and ora rite values included by mana whenua in Canterbury in the Te Tutei o Te Hau: Surveillance of the Wind (Canterbury Climate Change Risk Assessment)[3].

The regional transition strategy must also seek to ensure its actions do not add to the disproportionate burden already borne by Māori. Tangata whenua are uniquely impacted by climate change, and low emissions transition options that impose direct costs or risks onto iwi, hapū and whānau must be avoided. The broader social implications of transition opportunities will be a key consideration in the transition strategy development.

Low-income communities

Low-income communities are also disproportionately impacted by certain emissions reduction policies. Transition actions will need to be carefully assessed for impacts on living costs for these communities, as well as impacts on employment or economic opportunities.

[2] IPCC (2021). Masson-Delmotte, V.; Zhai, P.; Pirani, A.; Connors, S. L.; et al. (eds.). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press (In Press). Archived from the original on June 5, 2022.

[3] Canterbury Mayoral Forum (2022). *Canterbury Climate Change Risk Assessment*: Canterbury-CCRA-Report_FINAL_V5.0.pdf

Rural communities

Rural communities, by virtue of being agriculturally based, are also disproportionately impacted by certain emissions reduction policies. For example, regulations to reduce organic waste or implement stricter waste disposal standards may increase operational costs for small farms without access to large-scale composting facilities or alternative waste treatment options, while policies that propose herd reduction sizes would place significant burdens on some farm businesses. In addition, public transport is an urban solution to reducing transport emissions that has little to no applicability in most rural areas. As above, transition actions will need to be carefully assessed for impacts on these communities.

The next chapter in this Overview provides background and context on GHG emissions reductions in Canterbury. It looks at the types of GHGs that are relevant in our region, provides context from a national and regional perspective, and summarises our emissions profile.

2 Background

Relevant greenhouse gases (GHGs)

There are two main two types of GHG emissions: short- and long-lived climate forcers. Carbon dioxide (CO2) and nitrous oxide (N2O) are considered long-lived, while methane (CH4) is short-lived. The explanation between long-lived and short-lived climate forcers below is relevant given Canterbury's emissions profile, which shows a high contribution of methane emissions than some other regions in New Zealand.

CO2 remains in the atmosphere for tens of thousands of years. N2O has a lifetime in between that of CO2 and short-lived gases[4]. Concentrations of CO2 add cumulatively to the atmosphere as emissions continue. This means that temperatures increase indefinitely as long as CO2 emissions are maintained, then remain fixed at this level for centuries once emissions cease[5]. Alternatively, short lived climate forcers remain in the atmosphere for a much shorter time. These emissions do not add cumulatively as they break down much faster. For example, CH4 has an atmospheric lifetime of approximately 12 years. After an initial pulse of CH4, there will be a warming effect but if the emission rate of CH4 remains constant over time an equilibrium can occur where the emissions and removals are approximately balanced[6].

However, it is important to note that while methane is short-lived, it is estimated to be 28–36 times more effective at trapping heat in the atmosphere than carbon dioxide. Further, some of the heat trapped by methane causes other changes in the climate system, resulting in warming that extends beyond its short-term existence in the atmosphere[7].

A simplified analogy of filling a bathtub can help to understand the key difference between short-lived and long-lived gases. CO2 emissions are like filling up a bath slowly with the plug in. Even when you turn the tap up or down (increase or reduce emissions) the water level still rises[8]. In contrast, CH4 emissions are like turning the tap on high without the plug in. The water level rises fast but it stabilises with water going down the plughole (CH4 breaking down). Increasing CH4 emissions (turning the tap up) can still raise the water level, but turning it down (reducing emissions) results in the water level (temperature) subsiding.

[4] Ministry for the Environment website: Methane and other major greenhouse gases | Ministry for the Environment

[5] Knutti, R., & Rogelj, J. (2015). Legacy of our CO2 emissions: a clash of scientific facts, politics and ethics. *Climatic Change*, *133*(3), 361–373. https://doi.org/10.1007/s10584-015-1340-3

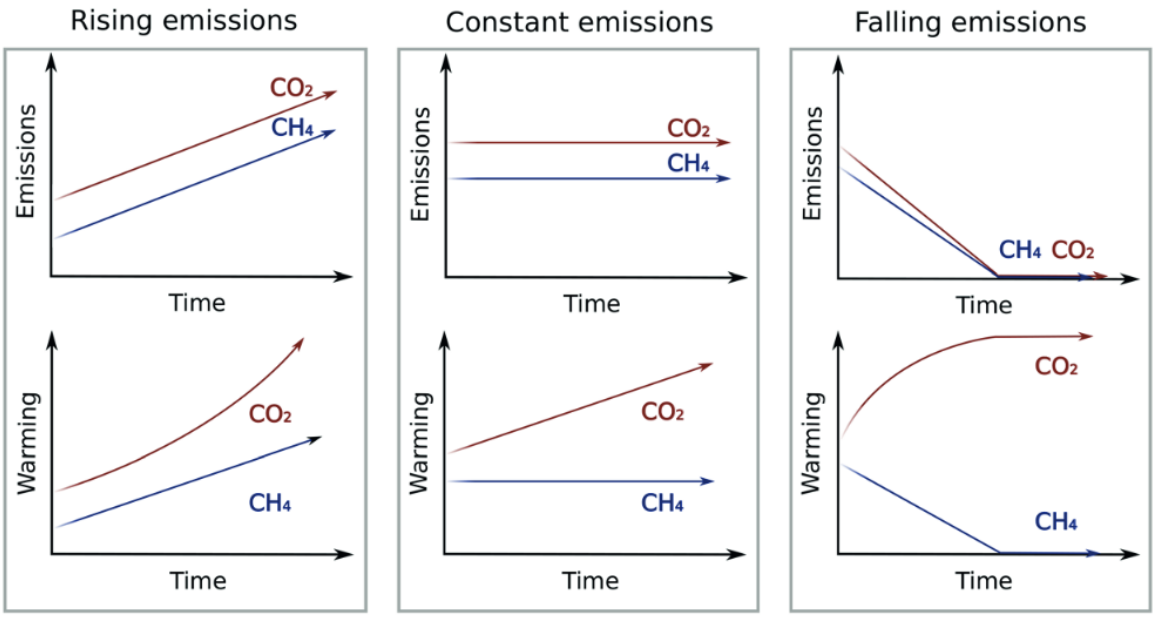
[6] Lynch, J., Cain, M., Pierrehumbert, R., & Allen, M. (2020). Demonstrating GWP: a means of reporting warming-equivalent emissions that captures the contrasting impacts of short- and long-lived climate pollutants. *Environmental Research Letters*, *15*(4), 44023-. https://doi.org/10.1088/1748-9326/ab6d7e

[7] New Zealand Agricultural Greenhouse Gas Research Centre: The science of methane | New Zealand Agricultural Greenhouse Gas Research Centre

[8] The bathtub analogy has been used to explain the impact of short and long lived gases for a number of years. This reference is taken from: Driver, G. (2023). *Burps & Bluster.* North and South. https://northandsouth.co.nz/2023/10/16/new-zealand-methane-emissions-global-warming/

The bathtub analogy exemplifies how the warming impact of CO2 is determined by total cumulative CO2 emissions to date, whereas for CH4 it is determined more by the current rate of emissions in any given decade, and is less dependent on historical CH4 emissions[9].

The figure below shows how the warming impacts of CO2 and CH4 differ in three scenarios:



Note. The schematic compares the response of CO2 to CH4 in three cases: emissions rising steadily, emissions constant, and emissions falling to zero (all cases over several decades). From "Climate metrics under ambitious mitigation" by Oxford Martin School. Copyright 2017 University of Oxford.

Climate change mitigation - the national context

At a national level, New Zealand climate change mitigation policy is set through our Paris Agreement Nationally Determined Contributions (NDCs), the Climate Change Response Act 2019, and resulting national emissions budgets and Emissions Reduction Plans.

The Paris Agreement aims to limit global temperature increase to well below 2°C and pursue efforts to hold warming at 1.5°C above pre-industrial levels. To realise this goal, GHG emissions must peak before 2025 at the latest, and decline by 43% before 2050[10]. A central aspect of the Paris Agreement is NDCs, which are countries' self-defined climate pledges. New Zealand ratified the Paris Agreement in 2016 and submitted our first NDC which committed to a 30% net GHG emissions reduction target below 2005 levels by 2030. The government updated our NDC in 2021 to a 50% reduction of net

[9] Allen, M., Cain, M. & Shine, K. (2017). *Climate metrics under ambitious mitigation; Oxford Martin School Briefing*. University of Oxford. https://www.oxfordmartin.ox.ac.uk/downloads/academic/Climate_Metrics_%20Under_%20Ambitious%20_Mitigation.pdf

[10] UNFCCC. (2024). *The Paris Agreement*. https://unfccc.int/process-and-meetings/the-paris-agreement

emissions below gross 2005 levels by 2030[11], and again in 2025 to 51 to 55 per cent compared to 2005 levels, by 2035[12]. Each of our NDCs have been economy-wide, covering the sectors outlined in the previous section but separating agriculture and forestry/other land use into two categories and considering transport within the energy sector.

While a recent decision by the United States of America to withdraw from the Paris Agreement has sparked commentary amongst a small number of other countries about doing the same, New Zealand's commitment to it remains[13].

New Zealand's Climate Change Response (Zero Carbon) Amendment Act, passed in 2019, requires New Zealand to reduce net emissions of all GHGs aside from biogenic methane to zero by 2050. Given New Zealand's unique emissions profile, a split-gas approach was taken by government, where biogenic methane emissions are considered separately to net emissions of all other GHGs (including non-biogenic methane). The Act sets into law a reduction of biogenic methane emissions to 10% below the 2017 levels by 2030, and between 24% to 47% below by 2050[14]. This is equivalent to a reduction of 0.13 Mt CH_4, and between 0.32 and 0.63 Mt CH_4 respectively.

The Act also established an independent Climate Change Commission to advise the government on climate change mitigation and adaptation, as well as to monitor progress towards the 2050 target. The Commission developed a demonstration pathway to delineate how the medium and long-term emissions targets can best be achieved. Key transitions along that path are noted in the figure below. The budget 1-3 columns in the table refer to New Zealand's emissions budgets, which determine the total quantity of emissions permitted to be released during a certain period; for context, the first budget allocates 290 Mt CO_2e, the second allocates 305 Mt CO_2e, and the third 240 Mt CO_2e, with each of these being net emissions values[15]:

[11] UNFCCC. (2021). *Submission under the Paris Agreement New Zealand's first Nationally Determined Contribution Updated 4 November 2021.* https://unfccc.int/sites/default/files/NDC/2022-06/New%20Zealand%20NDC%20November%202021.pdf

[12] Minister of Climate Change, media release, January 2025: Setting New Zealand's second international climate target | Beehive.govt.nz

[13] Minister of Climate Change, media release, January 2025: Setting New Zealand's second international climate target | Beehive.govt.nz

[14] New Zealand Government. (2022*). Aotearoa New Zealand Methane Emissions Reduction Action Plan*. https://www.mfat.govt.nz/assets/Climate-Change-Programme-images/Aotearoa-New-Zealands-Methane-Emissions-Reduction-Action-Plan-Full-Version.pdf

[15] Ministry for the Environment. (2024). Emissions budgets and the emissions reduction plan. https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reductions/emissions-budgets-and-the-emissions-reduction-plan/

		Budget 1	Budget 2	Budget 3
Transport	Lower-emissions vehicles	Accelerate uptake of electric and zero-emissions cars, buses and trucks Improve efficiency of vehicles and freight movement		Phase out imports of internal combustion engine light vehicles
	Reducing vehicle trips	Encourage switching to walking, cycling and public transport Reduce demand for travel, for example through smart urban development and increased working from home Increase use of rail and coastal shipping for freight		
	Aviation and shipping	Improve efficiency	Start electrifying ferries and coastal shipping	Start electrifying short-haul flights
	Low carbon liquid fuels		Increase use of biofuels	
Energy, industry and buildings	Buildings	No new fossil gas heating systems installed after 2025 Improve thermal efficiency		Start phasing out existing fossil gas use in buildings
	Electricity	Phase out fossil base-load generation	Transmission and distribution grid upgrades Expand renewable generation	Achieve ~95% renewable generation
	Industrial process heat	Replace coal with biomass and electricity		Replace fossil gas with biomass and electricity
Land	Agriculture	Adopt low-emissions practices on-farm	Adopt low-emissions breeding for sheep	Encourage new low biogenic methane technologies to be adopted when available
	Native forests	Ramp up establishing new native forests		Establish 25,000 ha per year
	Exotic forests	Average 25,000 ha per year of new exotic forests		Ramp down planting new exotic forests for carbon storage
Waste and F-gases	Waste	Divert organic waste from landfill Improve and extend landfill gas capture		
	F-gases	Increase end-of-life recovery of F-gases		

From: Climate Change Commission (2021). Ināia tonu nei: A Low-emissions future for Aotearoa.

The Commission's pathways visualising the above are shown below:

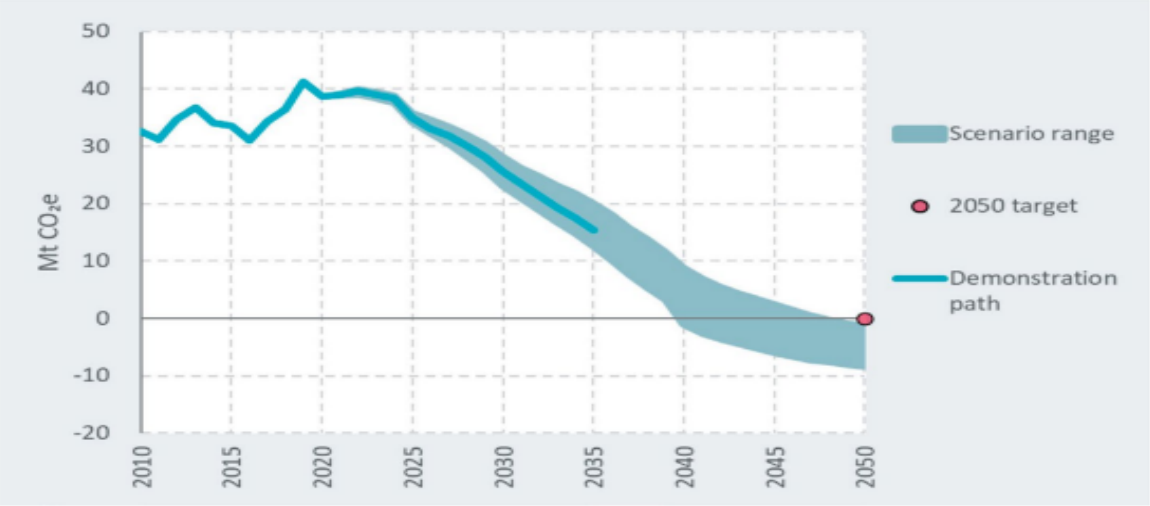


Figure 7.3: Long-lived greenhouse gas emissions in the demonstration path to 2035 compared with the long-term scenario range
Source: Commission analysis

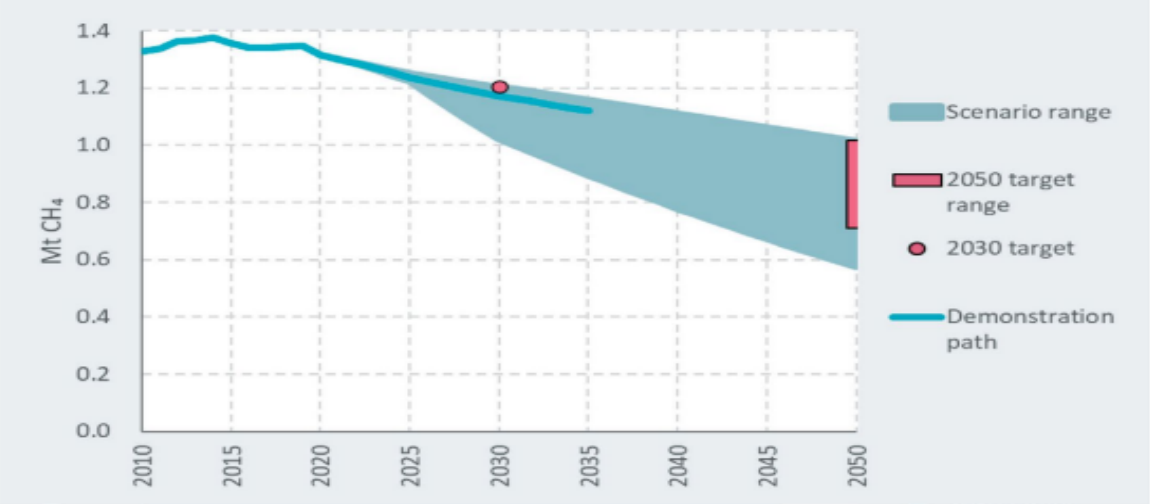


Figure 7.4: Biogenic methane emissions in the demonstration path to 2035 compared with the long-term scenario range
Source: Commission analysis

An Emissions Reduction Plan (ERP) is produced for each emissions budget period, informed by advice from the Climate Change Commission. The current ERP encompasses the Government's climate strategy across five priority areas: energy, transport, agriculture, forestry, and waste[16]. Key actions set out in the ERP include:

- increasing renewable energy projects (including through creating a more enabling consenting environment)
- enabling a network of 10,000 EV charging points by 2030

[16] Ministry for the Environment. (2024). New Zealand's second emissions reduction plan. https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reductions/emissions-budgets-and-the-emissions-reduction-plan/

- recognising carbon capture, utilisation and storage in the NZ Emissions Trading Scheme
- applying compulsory Refrigerants Regulated Product Stewardship (RRPS) scheme by 2027 (to be introduced from 2025)
- introducing an agricultural emissions pricing system by 2030 and incentivising uptake of new technologies
- limiting whole-farm conversions to forestry on high-quality land
- exploring private sector partnerships to increase afforestation on low-conservation Crown-owned land
- leveraging the Waste Minimisation Fund to enable resource recovery systems and infrastructure to process organic waste
- expanding landfill gas capture systems and making regulatory changes to increase landfill gas recovery rates[17].

Climate mitigation is also the subject of one of the Government's nine target areas for the public sector. Target 9 aims to ensure New Zealand is on track to meet our 2050 net zero climate targets, and includes ensuring total net emissions do not exceed 290 megatonnes from 2022 to 2025 and 305 megatonnes from 2026 to 2030[18]. The status of the first emissions budget is classed as on track with the second emissions budget classed as probable. The government considers that current interim projections give confidence that Target 9 can be achieved[19].

Following the publication of these targets, the Government released a climate change strategy outlining their approach to achieve New Zealand's climate goals in. The strategy focuses on five pillars:

- resilient infrastructure and communities
- credible markets to support the climate transition
- abundant and affordable clean energy
- world-leading climate innovation boosting the economy
- nature-based solutions addressing climate change.

An example of the Government's plans under the clean energy pillar is a goal to double renewable energy by 2050 and facilitate installing 10,000 public charging points for electric vehicles[20].

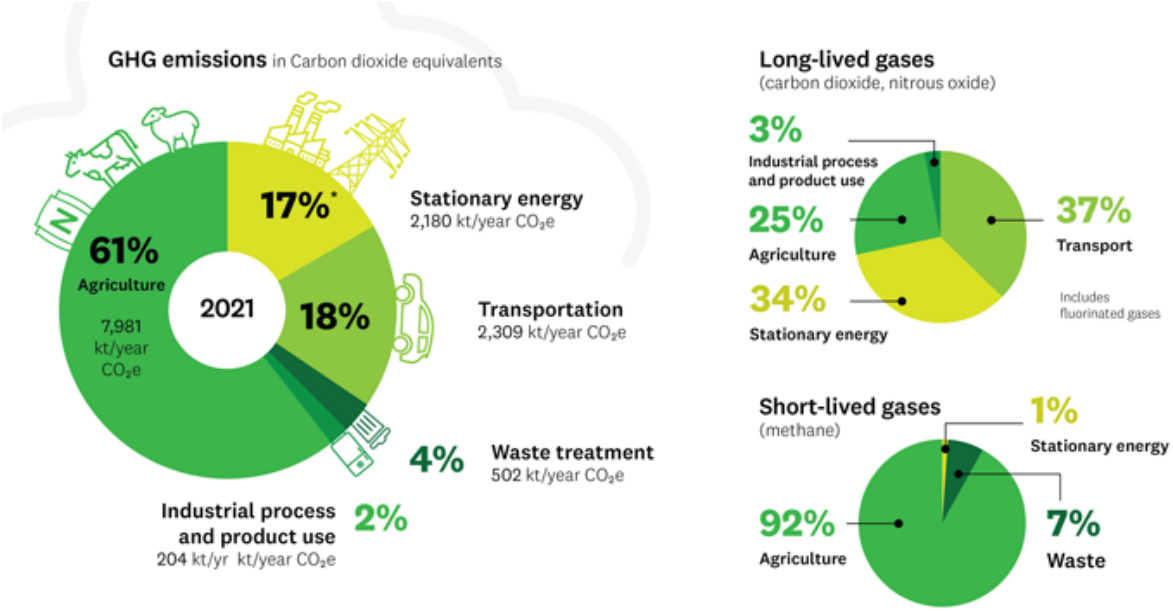
[17] Minister of Climate Change, media release, 2024. Our journey towards net zero | Beehive.govt.nz
[18] Department of the Prime Minister and Cabinet. (2024). *Government Targets.* https://www.dpmc.govt.nz/our-programmes/government-targets
[19] Department of the Prime Minister and Cabinet. (2024). *Target 9 Factsheet.* Factsheet - Target 9 - Reduced net greenhouse gas emissions - June 2024
[20] Ministry for the Environment. (2024). *The Government's climate strategy.* https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/about-new-zealands-climate-change-programme/governments-climate-strategy/

Climate mitigation - the regional context

CANTERBURY'S EMISSIONS PROFILE AND KEY EMITTING SECTORS

In New Zealand there is considerable variance in emissions per capita across different regions. Canterbury is one of the top GHG emitters by region[21]. Within the region the agriculture sector is the largest emitter, followed by transport then stationary energy. These three sectors combined contribute approximately 96% of regional emissions[22].

In 2021, the agriculture sector produced most of Canterbury's biogenic methane emissions and approximately a quarter of the region's long lived GHGs, totalling 61% of overall gross emissions, while the transport sector and stationary energy sector contributed 37% and 34% of long lived GHG emissions respectively[23]. The figure below demonstrates each sectors' contributions to short- and long-lived gases as well as overall regional emissions.



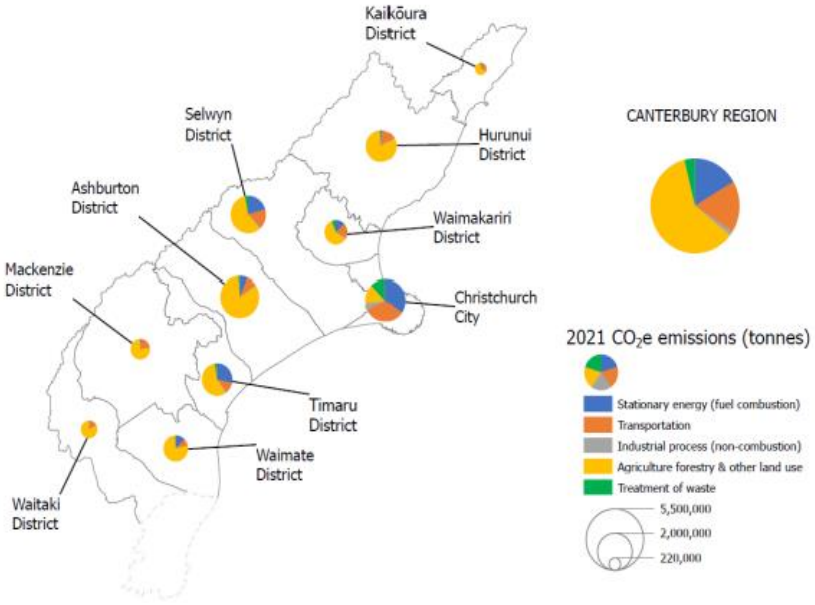
Note. The chart demonstrates gases emitted by sector in kilotonnes CO_2-e per year for 2021. The numbers on the chart refer to the main gases visible and do not represent totals for the sector. From "Annual Greenhouse Gas Emissions in Canterbury, 2018 and 2021" by Enviser Limited and Emission Impossible Limited.

Within Canterbury, there are differences in the emissions profile. Christchurch City, for example, has a high contribution of stationary energy and transport sources, compared to all other districts which are dominated by emissions from the agriculture sector. This is demonstrated in the figure below, which is also from the regional inventory:

[21] See, for example, Stats NZ data: Greenhouse gas emissions by region (industry and household): Year ended 2023 | Stats NZ

[22] Environment Canterbury. (2024). *Getting to net zero.* https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/what-we-know/climate-change/getting-to-net-zero/

[23] Canterbury greenhouse gas emissions inventory (2024). https://www.ecan.govt.nz/document/download?uri=5180120



The following section of this report focuses on the three largest emitting sectors in the region, including a discussion of historical changes and contributions to Canterbury's emissions profile.

Agriculture

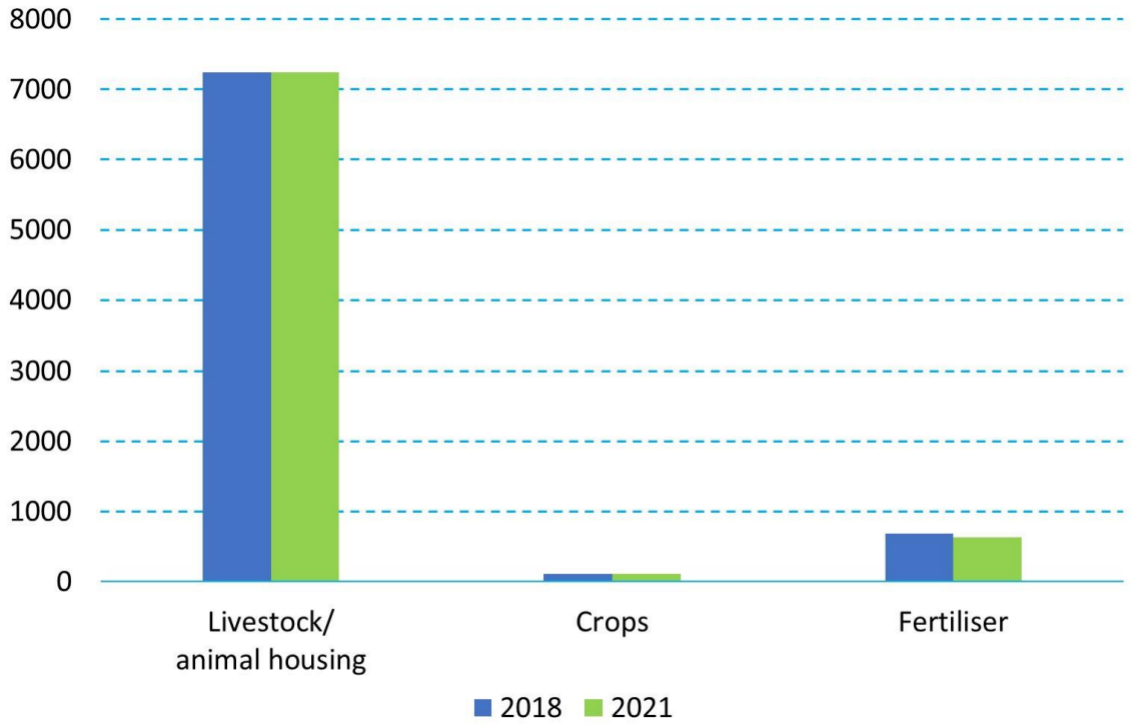
Sheep farming began to dominate the Canterbury plains in the years following European settlement in the mid 1800s, but dairying expanded rapidly following railway development and the establishment of large-scale irrigation in 1945. Total dairy stock numbers in New Zealand reached 2,859,977 in 1950[24]. The number of dairy cattle in Canterbury grew significantly in the last three decades, with a tenfold increase since 1990 (from 130,000 to 1.2 million in 2019)[25]. This growth resulted in a significant increase in methane (CH4) emissions[26]. Since 2007, primary industry emissions in Canterbury have increased by 20%, reaching 8,927k CO2-e in 2023[27]. In comparison with other regions in New Zealand, Canterbury ranked highest for CH4 emissions in 2023, with Waikato a close second[28]. Agricultural emissions in Canterbury are 4.1t CO2-e higher per person than the national average, and by 2050 the agriculture sector is projected to become the most significant source of emissions in the region[29].

In the regional inventory, the agriculture sector includes agriculture, forestry and other land use (AFOLU), but the term agriculture will be used for simplicity. The agriculture sector contributes the largest single GHG emission (CH4), as well as contributing considerable N2O emissions. The sub-

[24] Statistics New Zealand. (1950). *The New Zealand Official Yearbook 1950.* https://www3.stats.govt.nz/New_Zealand_Official_Yearbooks/1950/NZOYB_1950.html
[25] Stats NZ. (2021). *Livestock numbers*. https://www.stats.govt.nz/indicators/livestock-numbers
[26] Stats NZ. (2024). *Greenhouse gas emissions in the Canterbury Region, New Zealand.* https://www.stats.govt.nz/indicators/livestock-numbers
[27] ibid
[28] Stats NZ. (2024). *Greenhouse gas emissions (by industry and household): Year ended 2023*. https://www.stats.govt.nz/indicators/livestock-numbers
[29] Lumen. (2024). *Environment Canterbury: Advice on national GHG targets in a Canterbury context.*

sectors considered within the agriculture sector include livestock/animal housing, crops, and fertiliser. Within the livestock/animal housing sub-sector are emissions from enteric fermentation (digestive process occurring in ruminant animals that releases CH4), manure management (capture, storage and treatment of animal manure), animal housings and discharges from agricultural soils deriving from livestock[30]. The sub-sector of livestock/animal housing alone made up 56% of total regional GHG emissions in 2018, and 55% in 2021. The sector total for agriculture emissions was 8,034 k CO2e in 2018, and 7,981k CO2e in 2021.

Data from the regional emissions inventory for agriculture's sub-sectors is provided below (in kilotonnes CO2e per year):



For context, it is important to note that the regional greenhouse gas inventory did not include emissions from Forestry and Other Land-Use within the agriculture sector.
However, these emissions will be included in the next emissions inventory (data collected in 2025).

Transport

For context, between 1990 and 2021, overall GHG emissions from the transport sector in New Zealand increased 85%[31]. Canterbury is responsible for 14% of New Zealand's vehicle emissions and the region has one of the oldest, dirtiest and highest emitting vehicle fleets in the OECD[32].

Bus use in New Zealand increased 30% between 2001 and 2008, but during this time only 3% of journeys to work in Christchurch were by bus. In the Greater Christchurch area, public transport

[30] Canterbury greenhouse gas emissions inventory (2024).
[31] Hasan, M. A., Frame, D. J., Chapman, R., & Archie, K. M. (2019). Emissions from the road transport sector of New Zealand: key drivers and challenges. *Environmental Science and Pollution Research International*, *26*(23), 23937–23957. https://doi.org/10.1007/s11356-019-05734-6
[32] Environment Canterbury. (2024). *Transport Emissions.* https://www.ecan.govt.nz/your-region/living-here/transport/regional-transport-planning/transport-emissions/#e1182

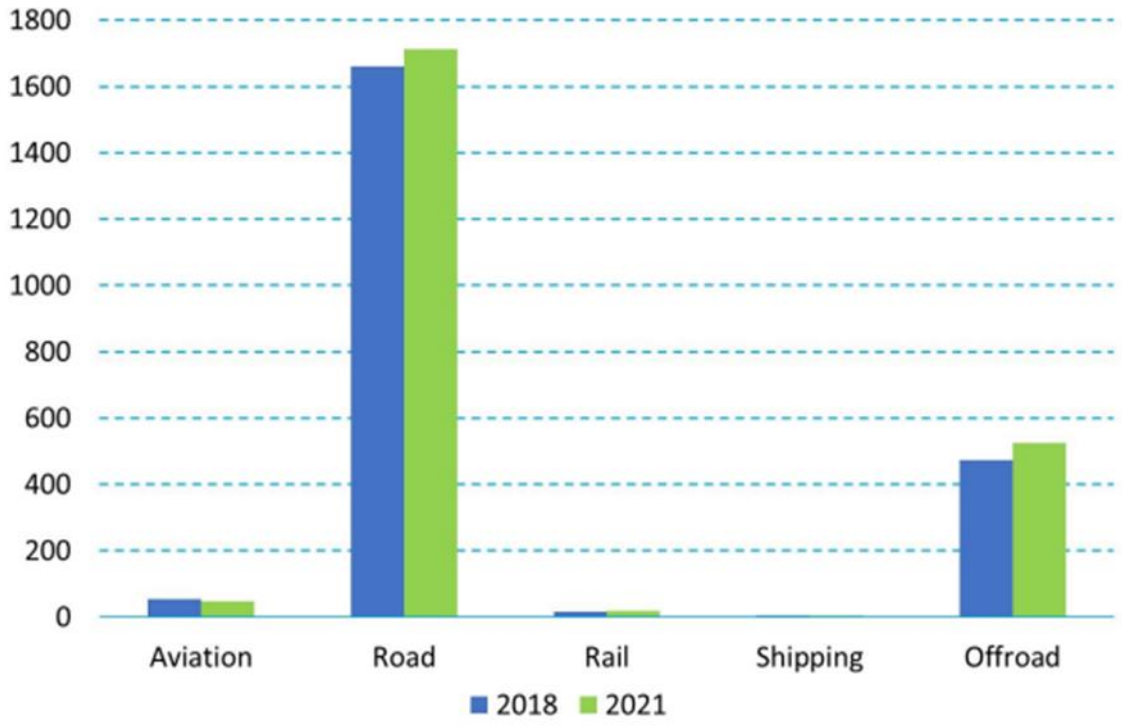
patronage was over 17 million in 2010, but reduced to approximately 13.5 million in 2016[33]. This rose to nearly 14.5 million passenger trips in the 2023–24 year[34] and is intended to rise further to 20 million annually by 2030 through planned public transport improvements, technology developments and subsidies[35].

Road transport emissions in the region have remained relatively steady in the last decade, at 1730kt CO2-e in 2013 compared to 1750kt CO2-e in 2023[36]. Increased fuel efficiency and the changing profile of Canterbury's vehicle fleet are identified as the main factors stabilising road emissions. The uptake of electric vehicles (EVs) in Canterbury has increased from 0.16% of registered vehicles being fully electric in 2018 to 0.82% in 2022[37]. This means the region ranked second highest for light electric vehicle (EV) ownership in 2022 at 17.1 EVs per 1,000 people [38]. Yet, these are minor percentages and EV market share in all regions of New Zealand has decreased recently following changes to national policies[39]. Overall, Canterbury's transport sector contributes 2,309kt/year CO2-e, or approximately 18% of the region's total emissions profile.

The transport sector includes emissions from five sub-sectors: aviation, road, rail, shipping and offroad. Road emissions are the highest transport sub-sector, contributing 13% of total regional emissions in both 2018 and 2021. Offroad emissions were the second highest sub-sector, contributing 4% of the total regional emissions in both 2018 and 2021, and emissions from all other sub-sectors were negligible (see figure below).

It is important to note that emissions for the aviation and shipping sub-sectors are likely to be underestimated due to a lack of data for "cruise" activities which hindered robust calculations. The sector total for transport emissions was 2,211k CO2e in 2018 and 2,309k CO2e in 2021.

[33] Stats NZ. (2016). *Public transport patronage in Greater Christchurch, New Zealand.* https://figure.nz/chart/IdIMKfI2ms5RHa3A
[34] Metro (2024): On a roll – record post-earthquake patronage for Greater Christchurch | Metro Christchurch
[35] Environment Canterbury. (2024). *Transforming public transport.* https://www.ecan.govt.nz/your-region/living-here/transport/public-transport-services/transforming-public-transport/#:~:text=As%20our%20urban%20areas%20grow,many%20benefits%20of%20patronage%20growth
[36] Environment Canterbury. (2024). *Transport Emissions.* https://www.ecan.govt.nz/your-region/living-here/transport/regional-transport-planning/transport-emissions/#e1182
[37] Allot, A. (2022). *Which region is leading the charge when it comes to electric vehicle uptake?* Stuff. https://www.stuff.co.nz/motoring/128776979/which-region-is-leading-the-charge-when-it-comes-to-electric-vehicle-uptake#:~:text=But%20not%20all%20regions%20were,(5380%20of%20654%2C977%20total).
[38] Environmental Health Intelligence. (2024). *Number of motor vehicles.* https://www.ehinz.ac.nz/assets/Surveillance-reports/Released_2024/NumberOfVehicles24.pdf
[39] Deloitte. (2024). *Are electric vehicles falling out of favour?* https://www.taxathand.com/article/34317/New-Zealand/2024/Are-electric-vehicles-falling-out-of-favor



Note. This figure shows the sub-sector emissions from the transport sector (kt CO2-e/year). From "Annual Greenhouse Gas Emissions in Canterbury, 2018 and 2021" by Enviser Limited and Emission Impossible Limited.

Energy

The stationary energy sector contributes approximately a third of Canterbury's long lived GHG emissions, with this sector including all fossil fuels used in electricity generation and in the direct production of industrial heat (e.g. manufacturing plants).

The stationary energy sector includes the following sub-sectors:

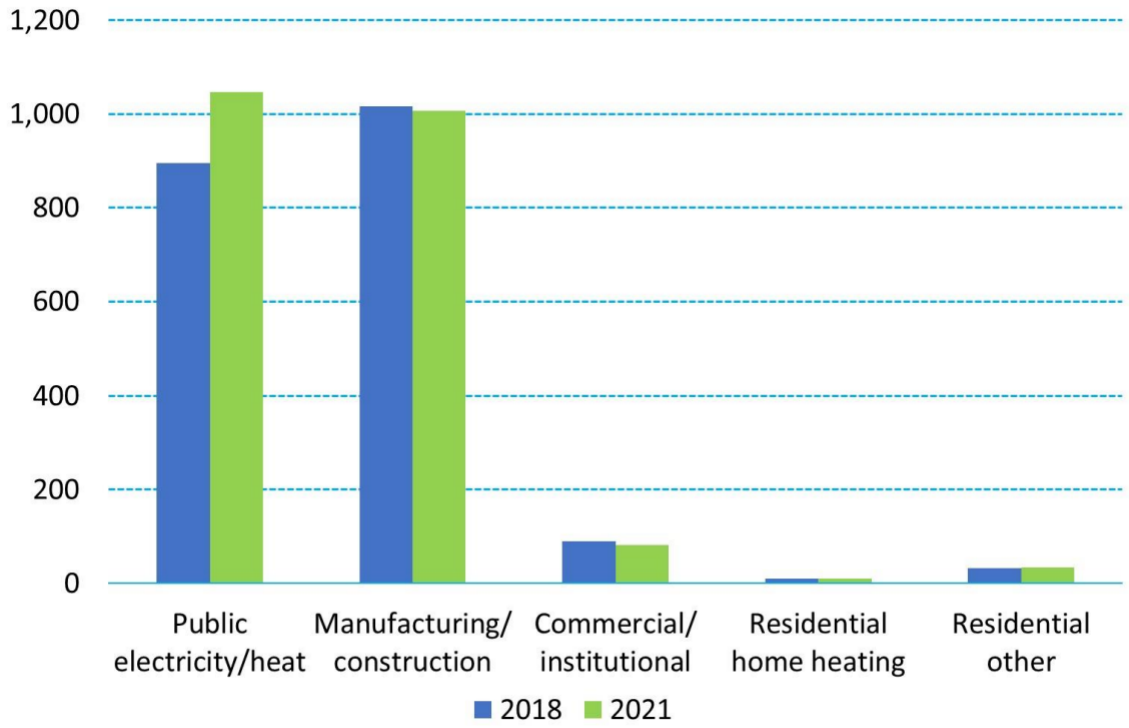
- public electricity/heat
- manufacturing/construction
- commercial/ institutional
- residential home heating
- residential other.

The manufacturing/construction sub-sector includes iron and steel manufacturing, non-ferrous metals, chemical manufacturing, food and beverages, pulp, paper and print and other industry like spray coating. The commercial/institutional sub-sector accounts for emissions from hospitals, crematoria, and education, among other general industries. The residential other sub-sector includes small scale domestic fuel use such as LPG for cooking, space heating and water heating. Public electricity/heat was the only sub-sector in the regional inventory that was reported at all three scope levels[40]. The provision of public electricity and heat, and industrial energy production make up the

[40] Scopes are based on the Global Protocol for Community Scale Greenhouse Gas Inventories framework. This framework considers the "scope" of emissions in terms of where emissions occur in relation to the geographic

predominant emissions in the stationary energy sector. The public electricity/heat and manufacturing/construction both contributed 8% of total regional emissions in 2021. The sector total for stationary energy emissions was 2,045k CO2e in 2018 and 2,180k CO2e in 2021.

The figure below from the regional inventory illustrates the emissions from the sub-sectors within the energy sector:



New Zealand's electricity generation system relies heavily on renewable energy sources, comprising mostly hydroelectric power generation (59.8% of total demand) as well as geothermal (18.5%) and wind (6.5%)[41]. Many of the country's hydro lakes are situated in Canterbury [42]. Electricity generation is also supported by the combustion of coal, oil and gas. New Zealand's first modern hydroelectricity power station was opened at Lake Coleridge in Canterbury in 1914[43].

Electricity generation emissions in New Zealand have increased significantly since 1990, with public electricity and heat production emissions up 32.3 percent in 2022[44]. The largest share of domestic emissions from the energy sector in Aotearoa has historically been combustion emissions from both public electricity and heat production, and road transport. These national statistics are reflected in Canterbury – for example, stationary energy is the single largest contributor to emissions in the

area. Scope 1 emissions are those generated and discharged entirely within the geographic boundary. Scope 2 emissions result from the use of grid-supplied electricity, heat, steam and/or cooling within the geographic boundary. Scope 3 emissions include those occurring outside the geographic boundary but resulting from activities taking place within it, such as waste sent out of a city.

[41] Ministry for the Environment. (2024). *GHG Inventory 2024.* https://environment.govt.nz/assets/publications/GhG-Inventory/GHG-inventory-2024/GHG-Inventory-2024-Vol-1.pdf

[42] See Our hydro power stations | Meridian Energy

[43] EEA. (n.d.). *History of our industry.* https://eea.co.nz/about-eea/history/

[44] Stats NZ. (2022). *New Zealand's greenhouse gas emissions.* https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions/

Christchurch area, growing from 24,524t CO2-e in 2022 to 32,712t CO2-e in 2024[45]. Regionally, Canterbury ranks fourth for the largest share of coal boilers by region (137 boilers) and is therefore fourth highest for process heat emissions by region at 416 kt CO2-e in 2022[46] . Overall, Canterbury's stationary energy sector contributes 2,180kt/year CO2-e.

Other emitting sectors

The remaining two emitting sectors in Canterbury are waste and industrial processes and product use (IPPU), together contributing approximately 6% of emissions in the region. While these sectors are not classed as key emitters, a brief overview of their emissions and sub-sectors is provided for context.

The IPPU sector includes non-combustion GHG emissions discharged from a wide range of industrial and commercial activities, such as dry cleaning, printing, coating application and chemical manufacture/storage. The following sub-sectors make up IPPU:

- other manufacturing
- lubricant and aerosol use
- medical applications
- refrigerants.

The medical applications sub-sector includes equipment like metered-dose inhalers. Fluorinated (F) gases are the dominant type of IPPU emissions with the highest emitting sub-sector being refrigerants. Yet the IPPU sectors' contribution to total regional emissions is minor at 200k CO2e in 2018 and 204k CO2e in 2021. IPPU emissions are much higher in other regions of the country compared to Canterbury due to the location of major industrial manufacturing sites[47].

Waste emissions are considered using the following sub-sectors:

- solid waste disposal
- waste incinerations
- opening burning
- waste treatment and discharge.

The waste incineration sub-sector only has one source: the combustion of landfill gas for biosolids drying at the Christchurch wastewater treatment plant. The open burning sub-sector includes garden waste in rural areas with these discharges being predominantly biogenic CO2. The highest emitting sub-sector is solid waste disposal at 3% of total regional emissions in 2021, overall emissions from the waste sector are primarily CH4[48].

The processing of waste and getting it to the landfill are other significant contributors of emissions relating to waste; however these are captured in other classes of emissions (such as transport).

[45] Christchurch City Council. (2024). *Stationary energy emissions.* https://smartview.ccc.govt.nz/apps/emissions/?stationary
[46] EECA. (2024). *Regional Heat Demand Database.* https://www.eeca.govt.nz/insights/eeca-insights/regional-heat-demand-database/
[47] Canterbury greenhouse gas emissions inventory (2024).
[48] ibid

EMISSIONS REDUCTION TARGETS

Canterbury's local government has not set regional emissions reduction targets. National targets are preferred due to their durability and existing political and social capital. Using national targets as a base for the low-emissions transition plan also allows for councils to develop their own district-level targets if they wish[49], without committing them to regionally-based targets.

Adopting national targets also provides flexibility to incorporate the targets of existing regional bodies. For example, as noted in the chapter on key actors and emissions reduction initiatives across Canterbury, the Canterbury Regional Transport Committee has set a regional target of 41% reduction in greenhouse gas emissions from land transport in Canterbury by 2035[50].

IMPLICATIONS OF NATIONAL POLICY SETTINGS ON EMISSIONS REDUCTIONS IN CANTERBURY

Decisions such as the make-up of the national vehicle fleet, emissions standards, the scale of forestry planting or the shift to a 100% renewable electricity system are made at a national rather than a local level. Local government therefore has limited ability to determine the key factors required in achieving overall emissions reductions. However, Canterbury councils have significant opportunity to support and influence regional emissions reductions through a variety of mechanisms.

Local government is required to incorporate climate change into existing frameworks and decision-making procedures, alongside integrating a climate change lens into activities like planning, transport, water resources and building regulations[51]. Addressing the impacts of climate change is also included under local governments' responsibility to meet current and future community needs in relation to local infrastructure, public services and regulatory functions[52]. Through these obligations, councils can facilitate a regional shift to a net-zero emissions economy, and aid in reducing the impact of this transition on communities.

As a result of the Climate Change Response Act 2019, councils will need to prioritise emissions reduction initiatives specifically over the Long Term Plan period, and ideally develop a roadmap to reduce GHG emissions[53]. In terms of the national ERPs, local government is required to 'have regard to' the current ERP when creating or altering regional policy statements or regional plans. Canterbury councils will need to direct attention to the ERP and demonstrate how it was considered within

[49] At the time of writing, the Christchurch City Council is the only council in the region to have set its own emissions targets.
[50] Regional Transport Committee (2024): Canterbury Regional Land Transport Plan: Canterbury transport plans | Environment Canterbury
[51] Ministry for the Environment. (2022). *Role of councils in preparing for climate change.* https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/climate-change-adaption-local-government/
[52] New Zealand Legislation Online: https://www.legislation.govt.nz/act/public/2002/0084/latest/DLM171803.html
[53] Ministry for the Environment. (2022). *Role of councils in preparing for climate change.* https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/climate-change-adaption-local-government/

planning decisions[54]. Local councils can be a key partner in many ERP actions including those involving public transport, waste management and land use.

Local councils also have a role in managing renewable energy supply development and distribution through spatial planning and resource consent processes. In addition, local councils also manage resource consenting for industrial boilers and IPPU applications. For example, the National Environmental Standards for Greenhouse Gases from Industrial Process Heat assists councils in reducing emissions from industries using process heat. The standards provide consistent requirements for reducing emissions through:

- prohibiting GHG discharges from new low to medium temperature coal boilers immediately and from existing coal boilers after 2037
- requiring resource consent for new and existing fossil fuel boilers emitting 500t CO2-e or above per site
- requiring resource consent applications to prepare and implement GHG emissions plans and set out action to reduce emissions[55] .

Councils can leverage these processes to support emissions reductions. Land transport policy and implementation of building code requirements are also other areas local government can influence. This is covered in more detail in chapter 6.

IWI AND MANA WHENUA PERSPECTIVES ON CLIMATE CHANGE

The Canterbury Climate Partnership Plan undertakes to implement a Treaty-based approach to climate actions. Iwi and mana whenua perspectives are therefore a key part of the context when developing a low-emissions transition plan. While the next part of this Overview provides greater detail on the climate mitigation activities of the region's Papatipu Rūnanga and their iwi Te Rūnanga o Ngāi Tahu, information on Te Tāhū o te Whāriki (Anchoring the Foundations)[56], the iwi's overarching climate strategy, is set out below to provide some insight as part of the background to climate mitigation in the region, as is some background on mana whenua.

Te Rūnanga o Ngāi Tahu, the iwi whose takiwā covers Canterbury's local government boundaries, recognises the challenges climate change presents and has been proactive and bold in its climate strategy, which was published in 2018. The strategy has a compelling and intergenerational vision:

- *Te Kaitiakitanga me te Tāhuhu:* Te Rūnanga will take appropriate action to adapt all areas of tribal interests and activity to withstand the compounding effects of our changing climate, to ensure Ngāi Tahu activities are aligned to the best projected climate change outcomes, and to make the most of opportunities, so that Ngāi Tahu Whānui have every chance to thrive even in the most extreme scenarios.
- *Tō tātou Ngāi Tahutanga:* We will face the challenges of a changing climate in our takiwā with the courage, resilience and wisdom of our tūpuna, strengthened by all that makes us

[54] Beca. (2023). *Climate Change Reform and the Impact on Local Government.* https://acrobat.adobe.com/id/urn:aaid:sc:AP:124e194a-fa5f-4cb7-8384-6910c06bfbcc
[55] Ministry for the Environment. (2023). *National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat*. https://environment.govt.nz/acts-and-regulations/regulations/national-environmental-standards-for-greenhouse-gases-from-industrial-process-heat/
[56] Te Rūnanga o Ngāi Tahu climate change webpage: Climate Change | Te Rūnanga o Ngāi Tahu

Ngāi Tahu, as we create a cultural legacy for those to come who must live in a changed world.

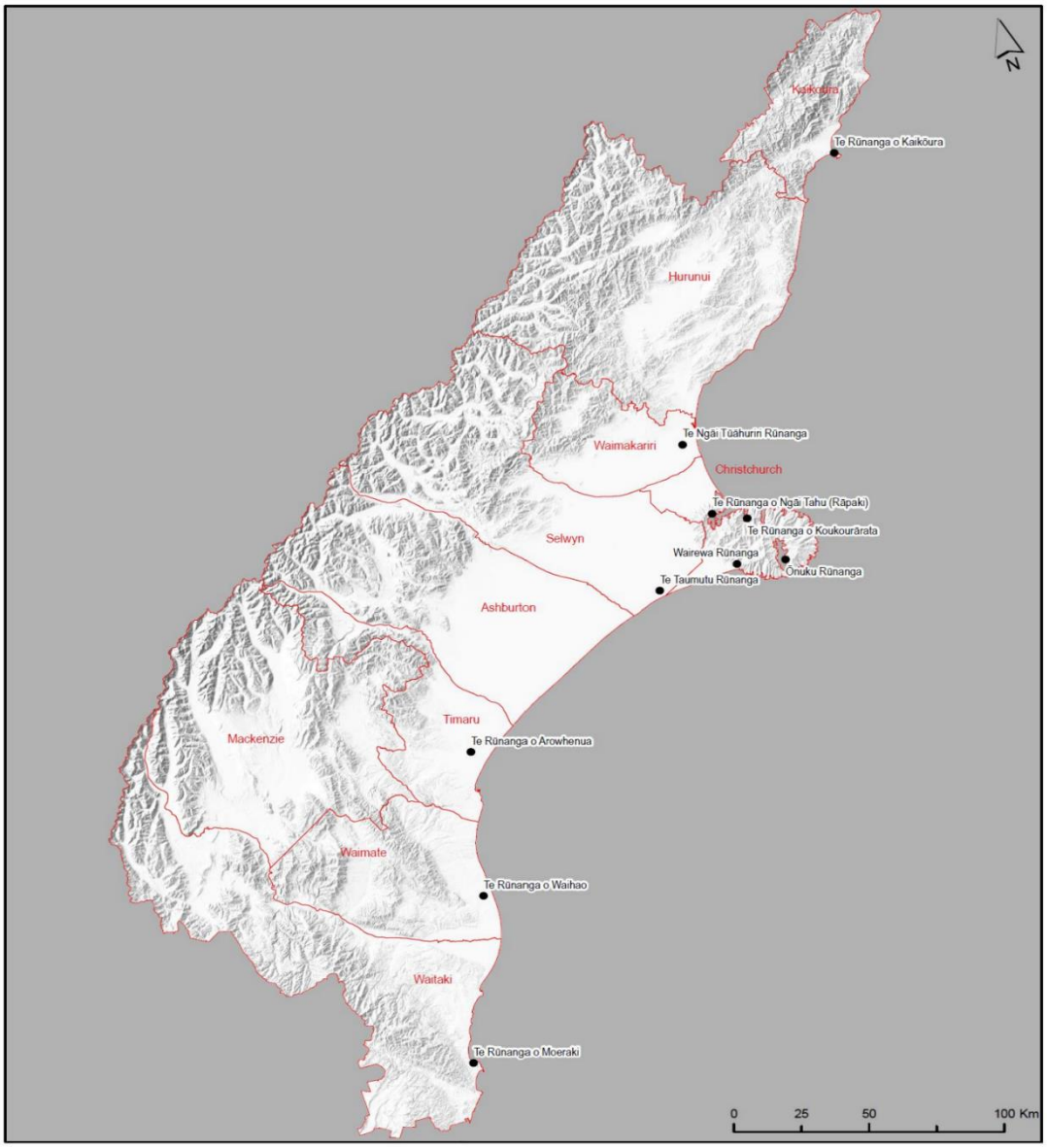
- *Te Ao Tūroa:* We will manage tribal resources wisely, continuing to protect wāhi tapu, mahinga kai and other taonga tuku iho where possible, focussing on strategic restoration activities, while actively investing in places and species of likely future abundance.
- *Ko Ngā Whakapāpātanga:* Ngāi Tahu Whānui are well informed about all aspects of climate change relevant to their interests and wellbeing. They know how the tribe as a whole is responding to the risks, challenges and opportunities, and can act with confidence within their whānau and hapū.
- *Te Whakaariki:* Te Rūnanga o Ngāi Tahu and Papatipu Rūnanga are embedded within key climate change response structures and programmes, working with central and local government and others. These programmes support desired outcomes for Ngāi Tahu Whānui as a result of tribal influence and leadership.
- *Te Whakatipu:* Papatipu Rūnanga have the resources and information necessary to generate and implement marae and community centred climate change response strategies that are designed to meet the needs of whānau and hapū, aligned with tribal direction.
- *Whānau:* Whānau needs and aspirations are central to tribal climate change response, with tribal resources targeted towards addressing fundamental challenges to kāinga within the takiwā, maximising opportunities for whānau, and assisting whānau facing climate change impacts in other parts of the country and the world.
- *Mātauranga:* Tribal investment in future-focussed education and training supports Ngāi Tahu Whānui to generate and take up opportunities related to climate change response.
- *Te Pūtea:* The economic base of Te Rūnanga o Ngāi Tahu is built on leading, climate responsible, innovative and adaptive businesses and partnerships, meeting the needs and aspirations of Ngāi Tahu Whānui while applying Ngāi Tahu values to address the business risks, challenges and opportunities associated with climate change.

As the climate strategy makes clear, how the climate continues to change in the future will largely depend upon how we as a global community act to reduce greenhouse gases[57]. The strategy guided the development of its climate action plan, Te Kounga Paparangi[58]. Greenhouse gas emissions is one of 6 key areas within the action plan, the overarching goal for which is to reduce operational emissions to net zero.

At the rūnanga level, 10 local rūnanga have mana whenua within the bounds of Canterbury's local government area. Each of the Papatipu Rūnanga have their own vision, aspirations and challenges for their people and land in responding to the challenges of climate change, meaning that the approach to climate action varies to take this into account. A summary of the initiatives being undertaken by the Papatipu Rūnanga is contained in chapter 4.

For context, a map showing the rohe of each of the rūnanga is displayed below[59].

[57] Te Rūnanga o Ngāi Tahu climate strategy (2018); Ngai-Tahu-Climate-Change-Strategy.pdf
[58] See Climate Change | Te Rūnanga o Ngāi Tahu
[59] Agenda paper: Canterbury Policy Forum (2018). Policy Forum agenda April 2018


N
Kaikōura
Te Rūnanga o Kaikōura
Hurunui
Waimakariri
Te Ngāi Tūāhuriri Rūnanga
Christchurch
Te Rūnanga o Ngāi Tahu (Rāpaki)
Te Rūnanga o Koukourārata
Selwyn
Wairewa Rūnanga
Ōnuku Rūnanga
Te Taumutu Rūnanga
Ashburton
Timaru
Mackenzie
Te Rūnanga o Arowhenua
Waimate
Te Rūnanga o Waihao
Waitaki
Te Rūnanga o Moeraki
0
25
50
100 Km

3 Key actors in emissions reduction in Canterbury

This part of the Overview identifies the key actors in emissions reductions across the region.

Assessing key actors supports the development of the low-emissions transition plan by identifying the organisations, industries and businesses that Canterbury's local and regional government needs to involve in transition action planning.

Key actors and their role in emissions reduction

Key actors have been identified based on the following criteria:

- the significant emitters in the region
- businesses or other organisations that are undertaking, or planning to undertake, emissions reductions initiatives in Canterbury (with a focus on those based in the region)
- the associated umbrella organisations/industry bodies or agencies that are supporting, influencing or associated with emissions reductions in each sector
- the role government entities, local government and iwi and rūnanga are playing in the region to reduce emissions or support others to do so.

The table below classifies the range of key actors relevant to a low-emissions transition in Canterbury, and identifies the role or the levers they have in relation to emissions reductions.

Actors have been categorised as follows:

- Iwi and mana whenua
- central government
- local government
- education and research
- industry – agriculture
- industry – manufacturing
- industry – infrastructure services
- industry – energy
- industry – transport
- industry – waste.

Actor category	Stakeholder or partner	Role, influence or levers in emissions reductions
Iwi and mana whenua	Te Rūnanga o Ngāi Tahu	Develops overall policy settings for the takiwā at an iwi level and emissions goals for Ngāi Tahu Holdings Limited and its subsidiaries Supports marae-centred climate response planning across the takiwā Advocacy role with government and councils as Treaty partner in the region
	Papatipu Rūnanga: • Te Rūnanga o Kaikōura • Te Ngāi Tūāhuriri Runanga • Rāpaki Rūnanga • Te Rūnanga o Koukourārata • Wairewa Rūnanga • Te Rūnanga o Ōnuku • Taumutu Rūnanga • Te Rūnanga o Arowhenua • Te Rūnanga o Waihao • Te Runanga o Moeraki	Sets and implements climate action aspirations, goals and plans for their rohe Advocacy role with government and councils Māori-Crown aerospace joint venture partnership between Kaitorete mana whenua Te Taumutu Rūnanga and Wairewa Rūnanga - considering renewable energy options for transport such as green hydrogen

Central government	Energy Efficiency and Conservation Authority (EECA)	Regulates energy-related products, processes and systems Provides information and motivation to promote "clean and clever" energy choices Provides targeted investment and support across the energy system[60]
	Ministry of Business, Innovation and Employment (MBIE)	Develops national policy settings for: • Energy • Building and construction • Science, innovation and technology • Resources • Small business and manufacturing • Economic development • Regional development[61] Manages range of contestable funding rounds for science and innovation[62] Developing an energy strategy for New Zealand
	Ministry of Primary Industries (MPI)	Develops national policy settings for leading, regulating, and enabling the primary sectors[63] 2025/26 action plan has a goal of "Delivering solutions for New Zealand farmers to reduce greenhouse gases by 2030"[64] Manages funds for:

[60] EECA website: https://www.eeca.govt.nz/
[61] MBIE (2024): Annual report: About MBIE | Ministry of Business, Innovation & Employment
[62] MBIE website: Funding information and opportunities | Ministry of Business, Innovation & Employment
[63] MPI website: MPI's structure | NZ Government
[64] MPI website: https://www.mpi.govt.nz/about-mpi/strategy/

		• improving the accuracy of our national greenhouse gas inventory and reporting • understanding more about how greenhouse gases are produced and how they can be reduced • international research into finding ways to grow more food without growing greenhouse gas emissions.[65] Oversees the Te Uru Rākau New Zealand Forest Service, which: • has responsibility for forestry regulations • provides a forestry advice service • manages the Emissions Trading Scheme for forestry • provides a range of grants and incentives • undertakes research for the sector[66].
	AgriZero NZ	Partnership between the New Zealand government and major agribusiness companies helping farmers reduce emissions while maintaining profitability and productivity[67]
	Ministry of Transport	Develops national policy settings for transport, including the GPS Land Transport Leading the policy work on the ERP's pledge to enable a network of 10,000 public EV charge points by 2030[68]
	Waka Kotahi/New Zealand Transport Agency (NZTA)	Executes national land transport policy and operationalises the National Land Transport Plan (NLTP).

[65] MPI website: Climate change and the primary industries | NZ Government
[66] Te Uru Rākau New Zealand Forest Service website: About Te Uru Rākau – New Zealand Forest Service | NZ Government
[67] AgriZeroNZ: About us | AgriZeroNZ
[68] Ministry of Transport (2024). Annual report: MOT-5495-Annual-Report-2024_FA2_web.pdf

		The NLTP is informed by Canterbury's regional land transport plan, developed by the Regional Transport Committee. NLTP funds or co-funds initiatives throughout New Zealand across 12 activity classes including: • local road improvements • public transport services • public transport infrastructure • rail network • walking and cycling[69]
	Ministry for the Environment (MfE)	Develops national policy settings for the environment and climate change, including: • developing ERPs • leading resource management policy and legislation • overseeing implementation of climate change legislation • undertaking environmental reporting • monitoring waste minimisation legislation • developing National Policy Statements (NPS) and National Environmental Standards (NES), including the NES for greenhouse gases – industrial process heat and NES for air quality Monitors the Climate Change Commission and the Environmental Protection Agency[70]
	Te Whatu Ora Waitaha Canterbury – Community and Public Health Te Mana Ora	Provides public health research and advice on climate change impacts in Canterbury[71]

[69] NZTA Waka Kotahi (2024). Planned investment by the activity class - NLTP 2024: Planned investment by the activity class - NLTP 2024–27
[70] Ministry for the Environment website: About the Ministry for the Environment | Ministry for the Environment
[71] Community and Public Health Te Mana Ora website: Climate Change | Community & Public Health

	Ministry of Education	School coal boiler replacement programme[72] (note this programme is due for completion in 2025)
Education and research	AgResearch	Science and research for the pastoral sector[73]
	Plant and Food Research	Science and research to improve the way New Zealand grows, fishes, harvests, prepares and shares food[74]
	Manaaki Whenua Landcare Research	Science and research for New Zealand's land environment and biodiversity[75]
	National Institute of Water and Atmospheric Research	Science and research on the climate and atmosphere[76]
	Scion Forest Crown Research Institute	Science and research on forestry, industrial biotechnology and advanced manufacturing[77]
	Climate Change Commission	Provides advice, monitoring and reporting to government that supports New Zealand's low-emissions transition. Includes advice on: • ERPs • Emissions budgets • Review of the 2050 target • recommended limits on units available each year and the price controls that operate at NZ ETS auctions[78]
	Canterbury University	Science and research across all sectors Building future workforce capability

[72] Aotearoa New Zealand Education Gazette (2023): Replacing coal boilers one step in the sustainability journey – Education Gazette
[73] See www.agresearch.co.nz
[74] See A smart green future. Together. · Plant & Food Research
[75] See Manaaki Whenua – Landcare Research is the Crown Research Institute for our land. » Manaaki Whenua
[76] NIWA website: Statement of Core Purpose | NIWA
[77] Scion website: Scion - Scion
[78] See Our upcoming work » Climate Change Commission

	Lincoln University	Science and research for the agriculture sector Seeks to deliver highly skilled workforce for New Zealand's food and fibre industries
	Ara Institute of Canterbury (Te Pūkenga)	Vocational education across all sectors Builds future workforce capability across all sectors
Local government	Canterbury councils: • Waitaki District Council • Waimate District Council • Timaru District Council • Mackenzie District Council • Ashburton District Council • Selwyn District Council • Christchurch City Council • Waimakariri District Council • Hurunui District Council • Kaikōura District Council • Environment Canterbury	Councils' key levers for emissions reduction relate to their planning, consenting and compliance functions. Regional councils set planning direction through Regional Policy Statements to manage coastal, water, air and land resources. In Canterbury, along with the RPS there is also the: • Canterbury Air Regional Plan • Canterbury Land and Water Regional Plan • Regional Coastal Environment Plan for the Canterbury Region These create the framework for planning at a city and district level. District Plans relate to planning for the use and development of land, including managing subdivision, noise, natural hazards, and contaminated land. Councils are required to 'have regard to' the government's ERP when creating or altering regional policy statements or regional plan. Councils must implement government environmental national direction and environmental standards. The most relevant ones directly related to

		emissions is the National Environment Standards for greenhouse gases in industrial process heat, and the National Environmental Standards for air quality. Councils must 'have regard to' the New Zealand waste strategy when managing waste, and must comply with the waste levy. Canterbury councils (aside from Waitaki) have formed the Canterbury Waste Joint Committee, which works together to collaborate on waste and improve alignment for regional waste minimisation and management. The Committee has a key role to play in reducing emissions from waste. Councils set their own climate plans, targets and decarbonisation initiatives. Councils are heavily involved in transport planning and funding alongside Waka Kotahi, and have a key role in public transport.
	Greater Christchurch Partnership	Advocacy for issues relating to the Greater Christchurch area, including urban development, economic development and transport
	Canterbury Mayoral Forum	Advocacy for regional issues, based on priorities outlined in the Plan for Canterbury
	Canterbury Waste Joint Committee	Responsible for advancing regional solid waste and hazardous waste minimisation in Canterbury[79]
	Regional Transport Committee	Statutory role under the Land Transport Management Act to develop regional land transport strategies that: • set out regional objectives and priorities

[79] See Canterbury Waste Joint Committee | Environment Canterbury

		• the activities proposed by councils in the region and the Transport Agency for state highways
	Economic Development Agencies: • Enterprise North Canterbury • ChristchurchNZ • Venture Timaru	Promote, advocate and support economic development in the district or sub-region
Industry – agriculture	Fonterra	Key exporter - exporting to more than 130 countries, accounting for about 25% of New Zealand's total exports Has processing sites across Canterbury and a distribution centre in Christchurch Fonterra is a cooperative, owned by thousands of New Zealand dairy farmers[80]
	Silver Fern Farms	Processor, marketer, and exporter of premium lamb, beef, and venison Exports to over 60 global markets Has two processing sites and a hub in Canterbury[81]
	AFFCO	Exports lamb, beef and allied products to over 80 countries Has a processing site in mid-Canterbury[82]
	ANZCO Foods	One of New Zealand's largest beef and lamb exporters, exporting to over 80 countries

[80] See Fonterra website: Fonterra
[81] See Silver Fern Farms website: Our Company | Silver Fern Farms
[82] See AFFCO website: About Us | Affco New Zealand

		Has four sites in Canterbury (two processing sites, one feedlot and its corporate head office) [83]
	Synlait Milk	Operates across three sites in Canterbury (6 nationwide), as well as two farms near the Dunsandel processing site Earns 6% of New Zealand's dairy export earnings[84]
	Oceania Dairy	Owned by China's largest dairy company, has a dedicated dairy farm near its site in South Canterbury and local milk suppliers[85]
	Dairy NZ	Industry organisation helping dairy farmers with sustainable dairying by investing in research, new solutions and advocacy
	Beef + Lamb	Farmer-owned industry organisation representing New Zealand's sheep and beef farmers
	Federated Farmers	Key lobby and advocacy organisation for farmers
Industry – manufacturing	McCain Foods	South Canterbury site has invested significantly in reducing industrial process heat emissions
	Meadow Mushrooms	Investing significantly in reducing process heat emissions
	Ravensdown Fertiliser Co-operative	Joined the Climate Leaders Coalition Investing significantly in reducing coal consumption and alternative fuels
	DB Breweries	Investing significantly in renewable energies at its Timaru site[86]

[83] See ANZCO Foods website: Premium New Zealand Beef and Lamb | Export Sales | ANZCO Foods
[84] See Synlait website: Our Company - Synlait Milk
[85] See Oceania Dairy website: Oceania Dairy
[86] For more information on McCain Foods, Meadow Mushrooms, Ravensdown, Fulton Hogan, Downer and DB Breweries emissions reductions, see the next chapter in the Overview.

	Foodstuffs South Island	Based in Greater Christchurch, and investing in waste, transport and refrigeration emissions reductions
	Business Canterbury	Advocate for business in North and Mid Canterbury
	South Canterbury Chamber of Commerce	Advocate for business in South Canterbury
Industry – infrastructure/ building services	Downer Group New Zealand	Key provider of integrated infrastructure services across New Zealand, with offices across Canterbury, laboratories in Christchurch and Kaikōura, and a bitumen plant in Christchurch. Joined the Climate Leaders Coalition, and is investing significantly in reducing vehicle emissions in its operations
	Fulton Hogan	Key provider of infrastructure services, with depots across Canterbury. Investing significantly in reducing CO2 emissions in its Christchurch asphalt plant
	City Care Group	Key provider of construction, maintenance and management services in Christchurch, committed to emissions reduction goals as part of the CCHL group
	NZ Green Building Council	Representative body advocating for a low-carbon built environment[87]
	New Zealand Construction Industry Council	Peak construction industry association for professions involved in the delivery of New Zealand's built environment[88]. Membership includes architects, designers, engineers, manufacturers, distributors, builders, surveyors, and developers. Advocates to government on behalf of its members on climate matters[89].

[87] See the NZ Green Building Council website: Home
[88] New Zealand Construction Industry Council website: Who We Are - NZ Construction Industry Council
[89] See, for example: NZCIC-Emissions-reduction-plan-submission-Final.pdf

Industry – energy	Power companies: • Meridian • Genesis • Mercury • Contact • Manawa	Investing in renewable energy and reducing own emissions[90]
	Transpower	Investing in enabling the move towards an increasingly renewable electricity system for New Zealand[91]
	Electricity Authority	Responsible for the governance and regulation of New Zealand's electricity industry[92]
	Mainpower	Electricity distribution network for the Waimakariri, Hurunui and Kaikōura districts[93]
	Alpine Energy	Electricity distribution network for South Canterbury (Timaru, Mackenzie, Waimate)[94]
	Orion	Owns and operates the electricity distribution network for Christchurch and Selwyn[95]
	Network Waitaki	Electricity distributor for Waitaki district (and North Otago)[96]
	Electricity Ashburton	Electricity distributor the Ashburton district[97]

[90] See, for example, Power companies lead charge on cutting emissions | RNZ News and New Zealand progressing at pace towards a highly renewable electric future | Electricity Authority
[91] Transpower website: Our carbon footprint | Transpower
[92] Electricity Authority website: Who we are | Electricity Authority
[93] Mainpower website: MainPower Electricity Distribution Network | North Canterbury and Kaikoura NZ
[94] Alpine Energy website: Alpine Energy - Understanding your electricity network
[95] Orion website: About | The Orion Group
[96] Network Waitaki website: Supplying North Otago, Hakataramea, and Ahuriri | Network Waitaki
[97] Electricity Ashburton website: Electricity and Fibre Networks in Mid Canterbury » EA Networks

	Business NZ Energy Council	Advocacy group (under the Business NZ) umbrella that includes energy-sector businesses, government entities, and research organisations; seeks to create a sustainable, equitable, and secure energy future[98]
	Sustainable Energy Association of NZ	Representative body leading the promotion, support and innovation of solar PV and energy storage solutions[99]
	Rewiring Aotearoa	Representative body focused on the energy transition to electrification[100]
Industry – transport	KiwiRail	Key part of the freight network in Canterbury
	Lyttelton Port Company	Key part of the freight network in Canterbury
	PrimePort Timaru	Key part of the freight network in Canterbury
	Christchurch International Airport	Key part of the freight network in Canterbury, as well as domestic and international passenger travel
	Canterbury-based freight companies	Key part of the freight network in Canterbury Many Canterbury freight businesses are actively reducing emissions through alternative fuels or moving to electric vehicles[101]
	Drive Electric	Advocacy group for electric vehicles. Membership includes power companies and electricity distributors, fuel companies, EV charging and infrastructure organisations, EV retailers, and vehicle companies[102]
	NZ Hydrogen Aviation Consortium	Consortium focused on designing a green hydrogen ecosystem for aviation[103]

[98] Business NZ Energy Council website: About | BusinessNZ Energy Council
[99] See About - Sustainable Energy Association of New Zealand
[100] See Home | Rewiring Aotearoa
[101] See the next chapter in the Overview for examples
[102] See members and more information here: Our Members - Drive Electric
[103] See Bringing decarbonised aviation to life

	Tāwhaki National Aerospace Centre	Exploring renewable energy projects, including solar, hydrogen production and carbon storage[104]
Industry - waste	Transwaste Canterbury	Manages waste (and emissions from waste) from Christchurch City, Selwyn, Ashburton, Waimakariri and Hurunui district councils
	EnviroNZ	Manages waste (and emissions from waste) at Redruth landfill and resource recovery centre in Timaru for Timaru, Waimate and Mackenzie district councils
	Ecogas	Company that uses anaerobic digestion technology and a biomass processing line to convert mixed kerbside organics and garden waste into renewable energy, fertiliser, biogas, and biomass – seeking consent for a Christchurch facility
	Waste Minimisation Institute of NZ	Representative body of Aotearoa New Zealand's waste, resource recovery and contaminated land sectors[105]

[104] See the next chapter in the Overview for more information
[105] WasteMINZ website: Home | WasteMINZ

4 Emissions reduction initiatives across Canterbury

This part of the Overview provides a summary of the range of emissions reduction initiatives already taking place throughout Canterbury by industry, government, iwi and rūnanga, and local government. It provides an opportunity to see a fuller picture of emissions reductions across the sectors, where there may be gaps, and opportunities for partnerships or collaborations.

Central government emissions reduction initiatives

The impact of central government policy and targets on local government and industry's ability to support and enable emissions reduction initiatives is significant. For example, local government is required to 'have regard to' the current Emissions Reduction Plan (ERP) when creating or altering regional policy statements or regional plans[106]. Additionally, under the Climate Change Response (Zero Carbon) Amendment Act 2019 councils need to prioritise emissions reduction initiatives specifically over the Long-Term Plan period. Central government also has a major role in removing barriers and supporting industry to make change by providing strong leadership and clear policy settings.

As noted earlier, the Government's key emissions reduction actions are contained in its Emissions Reduction Plan. The Background chapter of this Overview summarises the proposals contained within it.

Since publishing the ERP in December 2024, the Government has:

- set its second international climate target under the Paris Agreement, to reduce net emissions by 51 to 55 per cent compared to 2005 levels, by 2035[107]
- released a Hydrogen Action Plan, which aims to creating an enabling regulatory environment, reduce barriers for consenting hydrogen projects through Electrify NZ and RMA reform work programmes, promote a cost-effective and market-led transition to a low-emissions economy, and support access to international investment and markets[108]
- commenced developing a carbon capture, utilisation and storage framework[109]
- commenced drafting regulations to support a product stewardship scheme for synthetic refrigerants[110]

[106] Beca. (2023). *Climate Change Reform and the Impact on Local Government.* https://acrobat.adobe.com/id/urn:aaid:sc:AP:124e194a-fa5f-4cb7-8384-6910c06bfbcc
[107] Minister of Climate Change (2025): Setting New Zealand's second international climate target | Beehive.govt.nz
[108] Minister of Climate Change (2024): Low-emission hydrogen plan released | Beehive.govt.nz
[109] Minister of Climate Change (2025): Carbon capture one step closer | Beehive.govt.nz
[110] Minister for the Environment (2024): Reducing the environmental impact of synthetic refrigerants | Beehive.govt.nz

- published the Waste and Resource Efficiency Strategy, one of the five outcomes for which is to minimise emissions and environmental harm from waste and litter[111]
- drafted a Gene Technology Bill, which amongst other things will allow for the New Zealand-based development of scientific tools to help farmers meet methane emissions reduction targets[112].

Other relevant ongoing government actions supporting emissions reductions is set out in the table below.

Action/Initiative	Description
School Boiler Replacement Programme	Government programme replacing school boilers with low-emissions alternatives, to be completed in 2025. Estimated to reduce 34,500 tonnes of carbon emissions nationally over 10 years[113]
EECA support for decarbonisation	EECA offers various funding opportunities to support energy decarbonisation for emitting industries, including: • Technology Demonstration Fund: supports the development of new technology or innovative process improvements • Low Emissions Heavy Vehicle Fund: increases the uptake of zero and low-emissions heavy vehicles • Co-funding opportunities for business cases and feasibility studies relating to an energy efficient or renewable energy project • Co-funding for energy audits • Energy Transition Accelerator: supports businesses to make decisions and investments to help them on a low-emissions pathway • A fund to support investment in the public EV charging network • Warmer Kiwi Homes Programme, focusing on improving insulation and efficient heating in homes[114] In Canterbury, businesses such as McCain Foods, Silver Fern Farms and Fonterra have benefited from these opportunities[115].
National Policy Statement (NPS) for GHG Emissions	Sets regulations for reducing GHG emissions from industrial process heat, including phasing out coal-burning devices by 2037. Requires emissions plans and consistent resource consent assessments[116].

[111] Minister for the Environment (2025): https://www.beehive.govt.nz/release/government-releases-new-strategy-and-work-plan-deal-new-zealand%E2%80%99s-waste
[112] Minister of Science, Innovation and Technology (2024): Gene Technology Bill passes first reading | Beehive.govt.nz
[113] The Building Intelligence Group: Ministry of Education Coal Boiler Replacement Programme - In Progress | The Building Intelligence Group | Independent Project Management and Strategic Advisory services
[114] EECA: Co-funding and support | EECA
[115] See Case studies and articles | EECA
[116] Ministry for the Environment (2023): National-Direction-for-Greenhouse-Gas-Emissions-from-Industrial-Process-Heat-Industry-Factsheet.pdf

from Industrial Process Heat	Reduces industrial emissions, particularly from coal-based heat devices, and establishes consistent standards for emissions management.

While many of these central government initiatives are not specific to Canterbury, each will impact Canterbury in different ways. Taken alongside initiatives by local government, they form a key part of the enabling regulatory landscape to encourage industry and community emissions reduction.

Local government emissions reduction initiatives

Canterbury councils are investing in emissions reduction initiatives across the region. As councils differ in size and resources, some councils are further ahead than others with these initiatives. An outline of the key initiatives of the 10 councils is set out below, and includes their direct and indirect emissions reduction initiatives for context. The information is up-to-date as of March 2025.

As is demonstrated below, most councils are focused on reducing their own internal or operational council emissions as opposed to district-scale emissions reductions. While the focus of the transition plan project is on community emissions and not council emissions, information on council emissions reduction proposals or programmes is included here to provide a complete picture of initiatives in the region.

Some notable initiatives at the community emissions reduction level include:

- Christchurch City Council's sustainability fund to finance community-led climate action
- Waimate and Timaru District Councils' household guide to climate change to help households reduce their GHG emissions
- Christchurch City Council's emissions tool via SmartView
- Environment Canterbury's leasing of land in the Kōwhai park precinct to develop a large-scale solar farm.

Council	Initiatives
Kaikōura District	The Kaikōura District Council was a key driver in the process for Kaikōura to obtain the Green Globe 21 Certification in 2004. Kaikōura was the first town in the world to achieve this certification[117]. To do so Kaikōura adopted zero waste policies, measured environmental performance against a range of indicators and assessed the town's CO2 emissions[118]. Prior to this certification, the council founded Innovative Waste Kaikōura (IWK) in 1998. The goal of IWK is to divert waste from reaching landfill and help the town reach zero waste, thereby reducing waste-related GHG emissions. In recent years IWK managed the demolition and waste material from the 2016 Kaikoura earthquake, and in 2024 the Transfer Station Facility was opened to dispose of general waste via compacted capsules to the Kate Valley Landfill in North Canterbury. The Council is currently reviewing its 'A to B Carbon Free' Kaikoura Walking and Cycling Strategy[119], and its Waste Management and Minimisation Plan[120]. The Council has also developed a draft climate change policy[121].
Hurunui District	The Council has tracked its GHG emissions through emissions inventories since 2018. The Council is currently working to establish a corporate sustainability strategy to reduce GHG emissions[122]. The Council implemented a Waste Management & Minimisation Plan in 2023 which includes encouraging waste reduction in the community and improving efficiency in the waste network.

[117] New Zealand Government. (2004). *Environmental awareness a way of life: Speech to Kaikoura Green Globe 21 celebrations.* https://www.beehive.govt.nz/speech/environmental-awareness-way-life-speech-kaikoura-green-globe-21-celebrations
[118] New Zealand Government. (2004). *Kaikoura an example of sustainability for all.* https://www.beehive.govt.nz/release/kaikoura-example-sustainability-all
[119] Kaikoura District Council. (2009). *A to B Carbon Free: Kaikoura Walking and Cycling Strategy.* https://www.kaikoura.govt.nz/repository/libraries/id:2i17fvyhr17q9scmy0d8/hierarchy/Council/Plans%2C%20Policies%20%26%20Reports%20%28NB%20all%20docs%20in%20folder%20direct%20linked%20to%20webpage%29/POLICIES%20%28NB%20Every%20doc%20in%20folder%20direct%20links%20to%20website%29/Walking%20and%20Cycling%20Strategy%202009
[120] Canterbury Mayoral Forum. (2024). *Canterbury Climate Partnership Plan.* https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf
[121] ibid
[122] Canterbury Mayoral Forum. (2024). *Canterbury Climate Partnership Plan.* https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf

Waimakariri District	In 2019 the Council adopted a Climate Change Policy; relevant actions include incorporating emissions reduction targets into the Council's investment decisions, including measurable emissions reduction targets from Council operations in the Climate Change Response Strategy, ensuring low carbon, climate-resilient development is adopted as a key tenet of urban growth, development and land use decisions, and leading by example through reducing corporate GHG emissions[123]. The Council adopted the Organisational Sustainability Strategy and Action Plan in 2020, which highlighted as a key action engaging with the community to begin developing a district-wide GHG emissions reduction plan[124]. In 2024, the Council adopted the Moving Forward: Waimakariri Integrated Transport Strategy which has a key aim of reducing transport related emissions through investigating the opportunities for Council to support decarbonising freight, exploring funding opportunities for public transport, walking and cycling projects, and increasing the uptake of alternative modes of transport[125]. A key action in the Waimakariri Economic Development Strategy 2024-2034 includes engaging with the primary sector to create a roadmap for assessing the impact of emissions levies and climate change on the district's agricultural sector. The Strategy also has an action relating to supporting businesses to understand emissions recording, reduction, accreditation and offsetting options as an action, and to investigate the feasibility of a climate-focused local advisory service to connect rural and local businesses to climate change information and funding options[126].

[123] Waimakariri District Council. (2020). *Waimakariri District Council Climate Change Policy.* https://www.waimakariri.govt.nz/__data/assets/pdf_file/0017/120671/S-CP-5200-Council-Climate-Change-Policy-2020.pdf

[124] Waimakariri District Council. (2020). *Organisational Sustainability Strategy & Action Plan 2020.* https://www.waimakariri.govt.nz/__data/assets/pdf_file/0018/127233/200811102543-Organisational-Sustainability-Strategy-2020-2021-adopted-010920.pdf

[125] Waimakariri District Council. (2024). *Moving Forward: Waimakariri Integrated Transport Strategy 2035+.* https://www.waimakariri.govt.nz/__data/assets/pdf_file/0025/158425/231212199868-FINAL-MOVING-FORWARD-WAIMAKARIRI-INTEGRATED-TRANSPORT-STRATEGY-2035-ITS-ADOPTED-FEBRUARY-2024.pdf

[126] Waimakariri District Council. (2023). *Waimakariri Economic Development Strategy 2024-34.* https://www.waimakariri.govt.nz/__data/assets/pdf_file/0019/127243/Economic-Development-Strategy-2024-34-Booklet.pdf

	The Council also has a Property Acquisition and Disposal Policy that requires council property to be assessed for alternative purposes, including carbon sinks to offset emissions, before being disposed of[127]. The biodiversity team are working to assess existing biodiversity values and carbon sequestration potential of land parcels. As part of the Council's Climate Resilience Programme of Works 2024-2027, it is developing a District Climate Resilience Strategy and both organisational and district emissions reduction plans[128].
Christchurch City	In 2008 the CCC launched the Burwood Landfill Gas Utilization Project, which utilised methane gas from the Burwood Landfill to heat and power QEII Park. Following the Canterbury earthquakes, landfill gas was used to power the Council's Civic offices, saving approximately 5,000 tonnes of GHG emissions and $1.5 million annually[129]. Kerbside bin collection of rubbish, recycling and organics was introduced by the Council in 2008. This has allowed the composting of 50,000 tonnes of material annually. 44,000 streetlights have been upgraded across the city since 2012, which saves $1.5 million per year in energy and maintenance costs, and 1,150 tonnes of GHG emissions annually[130]. A Sustainability Fund was established in 2017 to finance community-led climate action. This fund has supported emissions reductions for local sports clubs, the Railway Society in Ferrymead, the Little River Playcentre, the Phillipstown Community Hub, the Diamond Harbour Community Hall, and the fund has supported the Christchurch Home Energy Saver programme which aims to deliver initial energy savings to 200 Christchurch homes in energy hardship[131]. The Council set a net zero carbon target in 2019 for all Council operations by 2030, as well as setting emissions reduction targets for the Christchurch District. These targets include reducing GHG emissions by 50% before 2030 from the baseline financial year 2016/2017 levels and reaching net-zero GHG emissions by 2045. Both targets exclude methane, but in the Climate Resilience Strategy published by

[127] Waimakariri District Council. (2024). *Waimakariri Natural Environment Strategy.* https://www.waimakariri.govt.nz/__data/assets/pdf_file/0031/167692/240607091999-FINAL-Natural-Environment-Strategy-Our-Environment-Our-Future.pdf
[128] Canterbury Mayoral Forum. (2024). *Canterbury Climate Partnership Plan.* https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf
[129] Christchurch City Council. (2025). *Our climate leadership.* https://www.prod-newsline.ccc.govt.nz/environment/climateaction/our-climate-leadership
[130] Christchurch City Council. (2025). *Our climate leadership.* https://www.prod-newsline.ccc.govt.nz/environment/climateaction/our-climate-leadership
[131] Christchurch City Council. (2025). *Sustainability Fund Projects.* https://ccc.govt.nz/culture-and-community/community-funding/sustainability-fund/innovation-and-sustainability-fund-projects

	the CCC in 2021, the Council committed to reducing methane emissions by at least 25% by 2030 and 50% from the baseline financial year 2016/2017 by 2045[132]. The Council received funding from the Orion Energy Accelerator to develop a greenhouse gas emissions tracker for the city. Through the SmartView tracker both the Council and public can understand the city's largest emission sources, assess different emissions reduction options and consider the opportunities to transition Christchurch to a low-emissions future[133]. The City Council's holdings company, through its council-controlled trading organisations, owns and runs some of Christchurch's key infrastructure, including electricity delivery, the port, the airport, fibre network, and recycling facilities. CCHL developed an emissions reductions plan for its group of subsidiary companies in May 2024[134].
Selwyn District	The Selwyn District Council adopted a Climate Change Policy in 2020, one of the components of which is aligning council activities to reduce carbon emissions and help create the conditions for a low-carbon economy that meets or exceed New Zealand's national targets[135]. The Council has been monitoring corporate carbon emissions since 2018 and is in the process of completing an emissions reduction plan that will include mitigation targets for 2030, 2033, 2036 and 2040. The Council is working towards a 30% reduction in category 1 and 2 emissions by 2030, and has set an aspirational target of reaching net zero emissions by 2040. Indicative actions as noted in the Long Term Plan largely relate to its own internal emissions, but does include an action to support community transport mode shift, including the provision of coordinated infrastructure to achieve this[136]. Selwyn District Council has also commenced development of area plans for Malvern, Ellesmere and Eastern Selwyn. These plans will include spatial identification of areas that could support new renewable energy generation in the future, as well as mapping the local distribution network and national grid needed to support this[137].

[132] Christchurch City Council. (2021). *Ōtautahi Christchurch Climate Resilience Strategy.* https://ccc.govt.nz/assets/Documents/Environment/Climate-Change/Otautahi-Christchurch-Climate-Resilience-Strategy.pdf
[133] Christchurch City Council. (2024). The way we're going. *https://smartview.ccc.govt.nz/apps/emissions/*
[134] Christchurch City Holdings Company (2024): CCHL-Climate-Statement-2024-v2.pdf
[135] Selwyn District Council. (2020). *Climate Change Policy.* https://www.selwyn.govt.nz/__data/assets/pdf_file/0015/400047/Selwyn-District-Council-Climate-Change-Policy.pdf
[136] Selwyn District Council. (2024). *Long-Term Plan 2024-2034.* https://www.selwyn.govt.nz/your-council/plans-And-reports/ltp-2024-2034
[137] Selwyn District Council (2025): Your Future Town - Selwyn Area Plans | Your Say Selwyn

Ashburton District	A key policy objective outlined in the Council's climate change policy is to manage its emissions to provide an example of effective climate change mitigation for the district. This objective also includes supporting businesses and households to reduce their GHG emissions. The Council has work underway to establish a benchmark for its carbon emissions and is working to reduce these emissions[138]. Developing an emissions reduction plan for the Council is an objective in its 2022 Climate Resilience Plan[139]. Development of a climate change strategy is under way.
Timaru District	The Council completed a carbon emissions inventory of the Council's operational activity in 2023[140]. In 2024, the Council adopted a Climate Change Response Policy to reduce operational GHG emissions and ensure the district can adapt to climate change. Relevant actions in this policy include reducing direct emissions beginning with fuel use at the Council, incorporating emissions mitigation into urban development and land use decisions, as well as future updates of the District Plan[141]. In partnership with the Waimate District Council, the Council published a household guide to climate change in 2024. The guide included information to help households reduce their GHG emissions, covering reducing emissions-intensive transport options, reducing food waste and switching diet choices, gardening changes, changing shopping habits, increasing energy efficiency and switching to renewable power generation, and reducing water consumption[142].
Mackenzie District	The Council completed a GHG emissions inventory for both the council and the district in 2024. The Council adopted its Waste Minimisation and Management strategy and plan in 2024 which focuses on reducing waste and increasing the diversion of waste from landfill.

[138] Ashburton District Council. (2022). *Climate Change Policy.* https://www.ashburtondc.govt.nz/__data/assets/pdf_file/0022/4792/Climate-Change-Policy-2022.pdf
[139] Ashburton District Council. (2022). *Climate Resilience Plan.* https://www.ashburtondc.govt.nz/__data/assets/pdf_file/0016/56041/20913-Climate-Resilience-Plan.pdf
[140] Canterbury Mayoral Forum. (2024). *Canterbury Climate Partnership Plan.* https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf
[141] ibid
[142] Timaru District Council & Waimate District Council. (2024). *Personal Responses to a Warming Planet.* https://www.waimatedc.govt.nz/repository/libraries/id:21r92ideo17q9sg7je9s/hierarchy/Documents/Community/Climate%20change/Personal%20Responses%20to%20a%20Warming%20Planet%20-%20Interactive%20TDCWDC%20June%202024.pdf

	The Council is working on a Climate Change Adaptation and Mitigation Strategy and Plan to ensure the district is prepared to respond to climate change. This Strategy and Plan will inform climate-resilient council decision making and action for the next three decades[143].
Waimate District	The Council completed a GHG emissions inventory for 2018/2019 and is working to complete their second carbon footprint assessment for 2022/23[144]. The Council is creating a climate change engagement platform with educational material on the Council website, and is developing a climate resilience strategy. Seven action plans have been identified to form the basis of the strategy. Four of these action plans (transport, land use and the built environment, carbon sequestration and natural restoration, and waste and circular economy) have emissions reduction actions. The objectives guiding the overall strategy include net zero emissions for the district, building climate resilience, and considering intergenerational sustainability[145]. As noted earlier, the Council also co-published a guide to household and personal responses to climate change with the Timaru District Council.
Waitaki District	The Council prepared its first corporate GHG inventory for 2018/19. It plans to update the GHG inventory and develop a climate change strategy[146]. The Council also appointed a Climate Change Advisor in 2022 to signal a commitment to reducing emissions and becoming more climate resilient[147]. The Council's 2023 Waste Management and Minimisation Plan includes an intention to foster community knowledge about a sustainable and low-emissions future in the district. One of the objectives of this plan is maintaining or increasing levels of waste minimisation and diversion, which if increased will reduce GHG emissions[148].

[143] Mackenzie District Council. (2024). *Responding to Climate Change.* https://www.mackenzie.govt.nz/pages/public-notices/2024/responding-to-climate-change
[144] Waimate District Council. (2024). *Climate Resilience Strategy Pathway.* https://www.waimatedc.govt.nz/repository/libraries/id:21r92ideo17q9sg7je9s/hierarchy/Documents/Community/Climate%20change/WDC%20Climate%20Resilience%20Strategy%20Pathway%202024-03.pdf
[145] Waimate District Council. (2025). *Action plan workshops.* https://www.waimatedc.govt.nz/community/climate-change/action-plan-workshops
[146] Canterbury Mayoral Forum. (2024). *Canterbury Climate Partnership Plan.* https://www.canterburymayors.org.nz/wp-content/uploads/COR9403-CCPP-Document.pdf
[147] Waitaki District Council. (2022). *WDC Appoints Climate Change Advisor.* https://www.waitaki.govt.nz/News/Climate-Change-Advisor
[148] Waitaki District Council. (2018). *Waste Management & Minimisation Plan 2018-2024.* https://www.waitaki.govt.nz/files/assets/public/v/2/files/our-council/plans-reports-and-strategies/other-plans-and-reports/waste-management-and-minimisation-plan-2018-24.pdf

Environment Canterbury	The Council established a climate change integration programme in the 2018-2028 Long-Term Plan to support climate change integration across the organisation and decision-making processes, and included a goal to support communities to become more risk literate and resilient to climate change[149]. In 2020, the Council completed a new bus contract procurement process introducing 39 new low-emissions and 25 new electric buses within a year. These new contracts resulted in a 14% reduction in public transport CO2 emissions within the first year. These contracts also included replacing another 28 vehicles within the first two years which brought the total vehicle replacement to 40% of the existing urban fleet[150]. In 2024, the Council added a further 21 new electric buses increasing the urban bus fleet to 25% electric. With the addition of these EVs, CO2 emissions are estimated to reduce by 22.8% compared to the existing diesel fleet, resulting in an annual CO2 reduction of over 3,600 tonnes. The addition of these electric buses will also reduce nitrogen oxide emissions by 22,000 kilograms and particulate matter but 193 kilograms. By 2035, it intended that the entire urban bus fleet will be fully electric[151]. Environment Canterbury completed an organisational carbon footprint assessment and decarbonisation plan in 2022[152]. The Tuam Street council office was the first building in the country to be awarded three certifications for environmental performance in 2023, including a net CarboNZero for Building Operations certification[153]. By the end of 2023, 100% of Environment Canterbury's passenger vehicles were hybrid or long-range electric vehicles[154].

[149] Environment Canterbury. (2018). *Long-Term Plan 2018-2028.* environmentcanterbury.sharepoint.com/sites/PublicTransport-group/NZTA/Forms/ByKeyword.aspx?id=%2Fsites%2FPublicTransport-group%2FNZTA%2FLongTermPlan2018-2028%2Epdf&parent=%2Fsites%2FPublicTransport-group%2FNZTA

[150] Environment Canterbury. (2020). *New low emission buses for Canterbury.* https://www.ecan.govt.nz/get-involved/news-and-events/2020/new-low-emission-buses-for-canterbury/

[151] Environment Canterbury. (2024). *Celebrating the acceleration into an electric bus future*. https://www.ecan.govt.nz/get-involved/news-and-events/2024/celebrating-the-acceleration-into-an-electric-bus-future/

[152] Environment Canterbury. (2025). *Our environmental contribution.* https://www.ecan.govt.nz/your-region/your-environment/climate-change/our-environmental-contribution/

[153] Environment Canterbury. (2025). *Our environmental contribution.* https://www.ecan.govt.nz/your-region/your-environment/climate-change/our-environmental-contribution/

[154] ibid

	In 2024, the Council published the first GHG emissions inventory report for Canterbury, analysing 2018 and 2021 regional emissions. The report informed the Climate Action Plan which was published in September 2024. Transitioning to a low emissions future is one of four key themes in the plan[155]. MyWay, the flexible, on-demand public transport service in Timaru, was successfully trialled by the Council and Waka Kotahi in 2020/21 and carries around 500-600 passengers on peak days[156]. It has increased use of public transport in Timaru by 30%, reducing transport GHG emissions through multi-passenger trips. In 2023, a parklet was introduced to the main street in Timaru to facilitate arrival into the centre of town. Since this change, MyWay patronage has significantly increased, with 500 people picked up or dropped off at the parklet in just the initial two weeks after opening[157]. Environment Canterbury has leased land within the Kōwhai Park precinct to Christchurch Airport to be used to develop a large-scale solar farm[158]. The Council is reviewing the Canterbury Regional Policy Statement (RPS), which sets the overarching policy direction for regional and district plans in the region. The draft RPS recognises the importance of supporting gross emissions reductions and the role planning has as a lever for councils to support reducing community and industry emissions[159].

[155] Environment Canterbury. (2024). *Climate Action Plan.*
[156] Environment Canterbury. (2022). *On-demand public transport looks to the future.* https://www.ecan.govt.nz/get-involved/news-and-events/2022/on-demand-public-transport-looks-to-the-future/
[157] New Zealand Transport Agency. (2023). *Timaru's MyWay parklet helps reduce emissions, thumbs-up from locals.* https://www.nzta.govt.nz/media-releases/timarus-myway-parklet-helps-reduce-emissions-thumbs-up-from-locals/
[158] RNZ (2023). Christchurch Airport signs up partners to build Kōwhai Park solar farm | RNZ News and Christchurch Airport: Kōwhai Park - A new concept in renewable energy - Christchurch Airport
[159] Environment Canterbury website (2024): Canterbury Regional Policy Statement | Environment Canterbury

Emissions reduction initiatives are also occurring at a regional and sub-regional level. An overview of these initiatives is set out below.

Organisation	Initiative
Regional Transport Committee	The Canterbury Regional Transport Committee (RTC) holds the responsibility for developing and implementing the Canterbury Regional Land Transport Plan (RLTP)[160]. The most recent RLTP was published in 2024 and spans the next decade. The plan outlines a vision for the next 30 years which involves ensuring resilient and low-emissions transport systems that help Canterbury thrive for generations. One of the six strategic objectives to achieve this vision is developing a range of transport emissions reduction solutions, with a headline target being a 41% reduction in GHG emissions from land transport in Canterbury by 2035. Another headline target is an 100% increase in tonnage of freight moved by rail in Canterbury by 2034. Supporting a wholescale shift to zero-emissions heavy vehicles is also included in the plan as a priority implementation area, and several of the policies to achieve the strategic objectives cover emissions reduction initiatives[161]. These include: • Advocate for targeted incentives to support a just transition to low emissions vehicles and other electric transport modes • Support the expansion of sustainable transport energy infrastructure such as electric charging stations and hydrogen fuel stations • Encourage innovation and economic development opportunities in Canterbury resulting from a low emissions transport system

[160] Environment Canterbury. (2024). *Regional transport roles and responsibilities.* https://www.ecan.govt.nz/your-region/living-here/transport/regional-transport-planning/roles-and-responsibilities/#e1326

[161] Environment Canterbury. (2024). *Canterbury Regional Land Transport Plan 2024-2034.* https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-transport-plans/

Canterbury Mayoral Forum	As well as implementing the Canterbury Climate Partnership Plan, a key project for the Forum this term is the development of a regional energy inventory[162]. This inventory is intended to create a shared picture of Canterbury's energy futures to inform consistent strategic planning, investment and partnerships across local government, industry, and councils.
Greater Christchurch Partnership	The Partnership developed both the Public Transport (PT) Futures Plan and the Mass Rapid Transit PT Futures programme to improve the accessibility, reliability, speed, frequency and capacity of public transport in the greater Christchurch area[163]. The PT Futures plan was implemented in 2020 and aims to double public transport uptake, which would substantially reduce CO2 emissions from the Greater Christchurch area. It is in stage one, which focuses on improvements on the inner core of Greater Christchurch, enhancing existing public transport[164]. The Mass Rapid Transit programme is a longer-term proposed option where a Turn Up and Go public transport service using either no-emissions light rail or long buses would be implemented. While the business case was completed in 2023, it requires co-funding to proceed[165]. As a result of public transport initiatives and the flat fare trial, the number of people using public transport in 2024 increased from 18% of the population to 24%[166].
Canterbury Waste Joint Committee	Administers a contestable fund for new and innovative projects that progress waste minimisation within the Canterbury region. The Committee is currently undertaking a project to improve regional collection of waste data and bring consistency to data collection, reporting, and accessibility in the region[167].

[162] Canterbury Mayoral Forum. (2024). *Canterbury Mayoral Forum mid-term achievements 2022-24.* https://www.canterburymayors.org.nz/wp-content/uploads/CMF-mid-term-achievements-2024.pdf
[163] Greater Christchurch Partnership. (n.d.). *Turn up and go/Mass Rapid Transit.* https://www.greaterchristchurch.org.nz/urbangrowthprogramme/transport
[164] Boffa Miskell. (2020). *Greater Christchurch Public Transport Futures Combined Business Cases.* file:///C:/Users/LilaM/Downloads/GreaterChristchurchPublicTransportFuturesCombinedBusinessCaseNonTechSummary20201119%20(2).PDF
[165] Greater Christchurch Partnership. (n.d.). *Turn up and go/Mass Rapid Transit.* https://www.greaterchristchurch.org.nz/urbangrowthprogramme/transport
[166] Environment Canterbury. (2024). *Transforming public transport.* https://www.ecan.govt.nz/your-region/living-here/transport/public-transport-services/transforming-public-transport/
[167] See the Committee's April 2025 meeting for an update on this work: Agenda of Canterbury Waste Joint Committee - Monday, 7 April 2025

Iwi and Papatipu Rūnanga emissions reduction initiatives

Te Rūnanga o Ngāi Tahu and several of the Papatipu Rūnanga in Waitaha have implemented emissions reduction initiatives or climate change actions/strategies. Through the Ngāi Tahu Climate Change Strategy, the iwi has outlined a range of climate change priorities under nine pou and heke. These priorities are categorised as either short/medium term actions (Te Pae Tata) which are to be completed by 2025, or longer-term actions (Te Pae Tawhiti) to be completed by 2050[168]. Te Rūnanga is committed to adapting Ngāi Tahu interests in response to the impacts of climate change, and ensuring their activities are aligned to the best projected climate change outcomes.

TE RŪNANGA O NGĀI TAHU MITIGATION INITIATIVES

Two specific emissions reduction priorities are set to be completed by 2050:

- working proactively to reduce Ngāi Tahu GHG emissions
- ensuring Ngāi Tahu Holdings Corporation and subsidiaries produce climate change response plans that include progressive GHG emission reduction targets[169].

Other short/medium term priorities in the strategy that may result in emissions reductions include:

- the development of Marae-centred climate change strategies
- wānanga to share and develop culturally-centred innovations and actions to respond to climate change
- implementing climate change champions to support education within their communities
- ensuring Te Rūnanga is represented on the Climate Change Commission and other key statutory bodies informing and managing climate change responses
- ensuring Papatipu Rūnanga are actively influencing regional and local government processes to develop climate change responses
- developing Papatipu Rūnanga climate response strategies
- upgrading all marae facilities to systems and technologies that will ensure long term climate resilience.

Priorities set out to be completed by 2050 that may contribute to emissions reductions include regularly reviewing and updating climate change strategies and response plans, and Ngāi Tahu continuing to research the impacts of climate and whānau-focused measures to build climate resilience[170]. Ngāi Tahu is making good progress on its emission reduction goals, having achieved the following to date:

- annual greenhouse gas emissions measured and audited since 2016
- investment in electric jet boat development
- phasing out diesel and petrol fleet vehicles
- key vendors reporting on and reducing their own key emissions
- investment in methane-reducing farm technology and practices[171].

[168] Te Rūnanga o Ngai Tahu. (2018). *He Rautaki mō te Huringa Āhuarangi: Climate Change Strategy.* https://ngaitahu.iwi.nz/assets/Documents/Ngai-Tahu-Climate-Change-Strategy.pdf
[169] ibid
[170] ibid
[171] Te Rūnanga o Ngāi Tahu (2025): Greenhouse gas emissions | Te Rūnanga o Ngāi Tahu

By 2030, the iwi plans to have achieved:

- a reduction in scope 1 & 2 emissions (excluding 'before the farm gate' farming emissions) by 42% (from a 2022 base year)
- a reduction in 'before the farm gate' farming emissions 30% (from a 2022 base year)
- 67% of scope 3 emissions have GHG reduction target[172]
- Ngāi Tahu Farming, a subsidiary of Ngāi Tahu Holdings, has a specific goal of reducing GHG emissions from its operations by 29% below 2017 levels by 2030. It has two large farming operations in Waitaha[173].

[172] ibid

[173] Ngāi Tahu Farming website: Ngāi Tahu Farming | When land and water are sustained, the people will prosper

PAPATIPU RŪNANGA INITIATIVES

Several of the Papatipu Rūnanga in Waitaha have developed strategies or plans that include climate actions. These involve the following:

Rūnanga	Initiatives
Ōnuku Rūnanga	Ōnuku Rūnanga has published a whānau-focused plan (Te Kori a Te Kō) to integrate mahinga kai management a with a climate change adaptation and mitigation plan in Akaroa harbour. The development and implementation of this plan will involve collaboration with the Christchurch City Council, Te Rūnanga o Ngāi Tahu and Environment Canterbury. The plan will weave together interconnected action areas, one of which is mitigation. Ōnuku Rūnanga have included identifying ways to reduce GHG emissions in this action area of the plan. Work across the takiwā to mitigate and adapt to climate change includes kelp farming in Akaroa harbour, indigenous reforestation and whānau and hapū education[174].
Te Taumutu Rūnanga	Te Taumutu Rūnanga published a climate strategy in 2024 (Ko Ngā Hau ki ētahi wāhi wāhi.- No matter which way the wind blows”). This strategy acknowledges the takiwā is already impacted by the impacts of climate change such as sea level rise, and flooding by rising ground water, Increased frequency and severity of events have impacted on significant sites, including wāhi taonga, wāhi tapu, wetlands, urupā and the church, ‘*Hone Wetere’*. The impact of the effects of rising sea levels are of major concern to the hapū, with relocation of Te Pā o Moki Marae being considered. Within their strategy, Ngāi Te Ruahikihiki ki Taumutu are committed to long term aspirations, founded within four Pou, Rangatiratanga, Kaitiakitanga, Ruahikihikitanga, Oranga: • We hold the mana for our takiwā and of our Rangatira • We are kaitiaki within our takiwā • We are descendants of Te Ruahikihiki • We embrace Te Whare Tapa Whā

[174] Ōnuku Rūnanga. *Te Kori a Te Kō – Redefining Our Sustainable and Prosperous Future* - Te Kori a te Kō | Ōnuku Marae

	Mitigation is a key focus within the climate change strategy, alongside adaptation and building resilience, actively leading climate-focussed kaupapa, and advocating for legislation that contributes to climate change mitigation. The strategy exists to provide direction as rūnanga works with local government and Taumutu whānau to develop an integrated approach to mitigating climate change impacts and creating a better future for Ngāi Te Ruahikihiki tamariki. Climate actions will be anchored by several projects, which are rūnanga led[175]. Te Taumutu Rūnanga, along with Wairewa Rūnanga, lead the Tāwhaki joint venture with the Crown. The renewable energy work that is being undertaken and its links to emissions reduction is set out in the transport information later in this chapter.
Te Rūnanga o Koukourarata and Te Hapū o Ngāti Wheke	Te Rūnanga o Koukourārata and Te Hapū o Ngāti Wheke (Rāpaki) have worked with the Christchurch City Council to develop a coastal hazards adaptation plan to prepare for sea level rise in Whakarāupo (Lyttelton Harbour) and Koukourārata, Port Levy. The plan focuses on managing vulnerable public assets such as roads, wharves and water supply pipes. Actions to be prioritised include essential services such as access, drinking water and wastewater[176]. This plan will inform Te Rūnanga o Koukourārata's own evolving climate plan, which is in progress[177].

[175] Te Taumutu Rūnanga (2024): Taumutu Climate Strategy 2024 – Ko ngā hau ki ētahi wāhi wāhi.
[176] Christchurch City Council (2025): Coastal hazards adaptation in Whakaraupō and Koukourarata : Christchurch City Council
[177] Canterbury Mayoral Forum (2024): Canterbury Climate Partnership Plan: COR9403-CCPP-Document.pdf

Industry emissions reduction initiatives

Industry-related GHG emissions make up the majority of Canterbury's emissions profile. Industry can be considered within the following sectors: agriculture, manufacturing, aviation, transport, logistics and freight, and education.

Many high GHG emitting companies and organisations, including fossil-fuelled process heat users, have developed and implemented emissions reduction initiatives. The Energy Efficiency and Conservation Authority (EECA) has produced Regional Energy Transition Accelerator (RETA) reports for both Mid-South and North Canterbury, which identify opportunities for large process-heat emitters to reduce emissions and ensure future regional demands are met[178].

EECA considers sites with fossil-fuelled process heat equipment larger than 500kW, spanning dairy, meat, industrial and commercial sectors. In total, the identified sites across Canterbury currently produce 914kt of CO2e emissions per annum. Three key options are outlined in the RETA plans to support organisations to eliminate process heat emissions[179]:

- Reduce demand through, for example, heat recovery, temperature optimisation, equipment replacement, thermal insulation and water flow reduction. These projects are often the best use of limited funds when considering energy productivity, marginal abatement cost, and the return on investment
- Increase thermal efficiency through, for example, installation of high temperature heat pumps. These projects can provide heating for process water, potable water on industrial sites or HVAC on commercial sites, and this option is economically preferable when heat requirements are lower than 100°C
- Move away from fossil fuels to low-emissions sources, including biomass and electricity. Large-scale conversion to biomass, typically using wood as a source of bioenergy (wood pallets, chip or hog), depends on a range of technical and financial considerations. Switching to electricity involves installing electrode boilers to generate heat. Electric boilers generally have lower purchase and installation costs, and increased efficiency, when compared to biomass boilers (yet currently grid-sourced electricity is more expensive than biofuel).

The best option for each site depends on multiple variables alongside the company or organisation's financing ability. When the reports were produced in 2023, 8 mid-south Canterbury sites and 14 north Canterbury sites had confirmed a switch to reduce emissions. 23 mid-south Canterbury sites and 29 north Canterbury sites were yet to commit to the final investment.

[178] Energy Efficiency and Conservation Authority. (2023). *Regional Energy Transition Accelerator North Canterbury – Phase One Report.* https://www.eeca.govt.nz/assets/EECA-Resources/Co-funding/RETA-North-Canterbury-Phase-One-Report.pdf and Mid-South Canterbury RETA | EECA

[179] ibid

The sites with confirmed projects in Canterbury (as at 2023) are outlined in the table below:

Site Name	Industry	Bioenergy Required in TJ ('000t)	Electricity Peak Demand (MW)
McCain Foods (NZ) Ltd, Timaru	Manufacturing	175 (24.3)	N/A
Makikihi Fries	Manufacturing	13 (1.8)	N/A
Ashburton College	Education	2 (0.3)	N/A
Waitaki Boys	Education	2 (0.2)	N/A
Oamaru Intermediate	Education	1 (0.1)	N/A
Timaru Girls High School	Education	1 (0.1)	N/A
Woolworks NZ, Washdyke	Manufacturing	N/A	9
Canterbury Spinners Ltd, Oamaru	Manufacturing	N/A	3
Meadow Mushrooms Hornby	Horticulture	N/A	4.75
Hamilton Jet Christchurch	High Temperature Manufacturing	N/A	1.26
Synlait Milk Dunsandel	Dairy Processing	419.76 (58.43)	6.06
Christchurch Hospital	Hospitals (with Surgery)	208.91 (29.08)	N/A
University of Canterbury Ilam Campus	Education	207.22 (28.84)	N/A
Gladfield Malt Dunsandel	Food & Beverage	39.71 (5.53)	N/A
Darfield High School	Education	2.42 (0.34)	N/A
Amuri Area School	Education	0.35 (0.05)	N/A
Opawa School	Education	0.35 (0.05)	N/A

Examples of emissions reductions by industry in Canterbury are set out below. These examples are not an exhaustive list, and do not include all RETA sites. Instead, this section aims to provide an overview of emissions reduction initiatives from key emitting sectors to support understanding of the main transition options, and to inform how local government may support or enable emissions reduction initiatives for other companies and organisations. The examples include:

- companies and organisations identified in the RETA reports
- companies included in the top 100 emitters from the regional emissions inventory
- large emitters in the region with sufficient information on their emissions reduction initiatives
- other examples identified during research.

As noted above, the RETA reports have identified a number of significant emitters that are still determining their decarbonisation commitments. For that reason, they are not covered in the below examples.

AGRICULTURE:

Organisation	Initiatives
Fonterra	Fonterra has two dairy manufacturing sites in South Canterbury (Clandeboye and Studholme). The co-operative has committed to a 50% reduction in Scope 1 and 2 emissions by 50%, exiting coal from all 29 sites by 2037 and achieving net zero emissions by 2050[180]. In February 2024, Fonterra implemented a heat recovery project at the Clandeboye site which aimed to decrease annual carbon emissions by approximately 3,000 tonnes[181]. In September 2024, the co-operative announced their largest decarbonisation project to date, also occurring at the Clandeboye site. The $64 million project is co-funded by EECA, and it involves converting two coal boilers to wood pellets. The conversion will reduce Fonterra's overall manufacturing emissions by 9%, equating to 155,000t CO_2-e per year[182]. In the partnership agreement with EECA, Fonterra has committed to achieving an approximate reduction of 1.2 million tonnes of CO_2-e from coal reduction activities this decade. This will mean the co-operative can lift its 2030 target from a 30% absolute reduction to 50% by 2030[183]. The Clandeboye site has two remaining coal boilers which will be transitioned to renewable energy as part of Fonterra's wider decarbonisation plans. As described later in the international influences chapter of the Overview, Fonterra is also supporting on-farm emissions reduction through a range of incentives, including offering to pay farmers that meet certain climate criteria an increased amount per kilogram of milk solids, and funding to try new technologies or improve genetics[184].

[180] Fonterra. (2025). *Getting out of coal*. https://www.fonterra.com/nz/en/coal.html
[181] Fonterra. (2024). *Fonterra announces its largest decarbonisation project to date.* https://www.fonterra.com/nz/en/our-stories/media/fonterra-announces-its-largest-decarbonisation-project-to-date.html
[182] RNZ. (2024). *Fonterra converting two coal boilers in bid to reduce emissions.* https://www.rnz.co.nz/news/business/536466/fonterra-converting-two-coal-boilers-in-bid-to-reduce-emissions
[183] Fonterra. (2024). *Fonterra announces its largest decarbonisation project to date.* https://www.fonterra.com/nz/en/our-stories/media/fonterra-announces-its-largest-decarbonisation-project-to-date.html
[184] Fonterra, media release (2025): Fonterra announces new incentives for farmers to reduce emissions |

Silver Fern Farms	Silver Fern Farms has an office and one of its processing sites in Canterbury. The company has committed to reaching zero coal usage by 2030 and reducing operational Scope 1 and 2 emissions by 42% by 2030[185]. Silver Fern Farms also has targets to divert organic and inorganic waste from landfill, reduce water use intensity, reduce total energy use, reduce wastewater gas capture and flare, and reduce 900T CO_2-e emissions through energy savings by 2025. The company also implemented a 'Net Carbon Zero by Nature' programme which aims to ensure that the equivalent of 100% of end-to-end emissions have been absorbed by actively growing permanent vegetation on the farm where the animals were raised[186]. Maintaining this certification requires both emissions and removals to be independently measured and verified. This programme will be implemented at the Christchurch processing site, as will actions outlined in the Climate Action and Transition Targets and Pathways plan spanning 2023-2030. The emissions reduction related targets include supporting over 2000 farmers to develop emissions management plans and developing a full range of Net Carbon Zero Products (e.g. beef, lamb, venison, leather, trim and petfood) in multiple markets by 2026[187].
AFFCO	AFFCO has a modern sheep, beef and calf processing plant in the Selwyn district. AFFCO partnered with EECA to implement an energy management programme in 2018 across all its sites, which has reduced annual carbon emissions by 9,800tonnes CO_2-e and annual energy use by 45GWh[188]. The energy reduction initiatives to achieve these reductions included infrastructure and operational changes such as adjusting the use of industrial fans, alongside a behaviour change programme[189].
ANZCO Foods	ANZCO Foods has four Canterbury locations including a lamb processing site in Rakaia, a cattle, lamb, calves and co-products processing site in Canterbury, a Foods Feedlot site (Five Star Beef) for cattle in Canterbury and a corporate Christchurch office.

[185] Silver Fern Farms. (2024). *Our Climate Action and Transition Targets and Pathways 2023-2030.* https://silverfernfarms.com/content/dam/sff-main-site/en/our-company/our-sustainable-chain-of-care/SFF%20Climate%20Action%20Pathways.pdf
[186] Silver Fern Farms. (2025). *Sustainability.* https://silverfernfarms.com/nz/en/our-company/sustainability#accordion-ea26f13ab2-item-364b29e7e8
[187] Silver Fern Farms. (2024). *Our Climate Action and Transition Targets and Pathways 2023-2030.* https://silverfernfarms.com/content/dam/sff-main-site/en/our-company/our-sustainable-chain-of-care/SFF%20Climate%20Action%20Pathways.pdf
[188] AFFCO. (2025). *Our Environment*. https://www.affco.co.nz/our-communities/our-environment/#:~:text=At%20AFFCO%2C%20we%20recognise%20the%20importance%20of%20our,to%20reduce%20our%20carbon%20footprint%20and%20energy%20use
[189] Mission Zero. (2024). *Reducing energy-related carbon emissions.* https://missionzero.nz/reducing-energy-related-carbon-emissions/

	ANZCO Foods achieved a Toitū Carbon Reduce Certification in 2020, with the carbon footprint of ANZCO Foods Canterbury and the Five Star Beef site being audited and certified in 2019. As part of the Toitū Certification, the company developed an emissions reduction plan which includes upgrading their ammonia refrigeration system, implementing high temperature heat pump technology to replace coal boilers, and trailing Mootral feed supplement at the Five Star Beef site to reduce methane emissions from cattle[190]. Implementing the new heat pump technology has estimated savings of $250,000 and 2,900 tonnes CO_2-e annually, and the key performance indicators of the project included a 10% reduction in site annual coal consumption and an 8% reduction in site annual CO_2 emissions[191].
Synlait Milk	Synlait Milk has two sites in Canterbury, their primary manufacturing facility in Dunsandel and Talbot Forest Cheese in Temuka, alongside a satellite office in Christchurch. The company has published sustainability reports since 2018 and GHG inventories since 2020. In the 2024 financial year, Synlait reduced their Scope 1 GHG emissions by 20% compared to 2020. This was achieved through increasing the use of biomass to fuel their boilers. The company is the first dairy processor in New Zealand to financially incentivise farmers to improve environmental outcomes. Synlait aims to reduce the intensity of on-farm emissions by 30% and reach a 45% absolute reduction of Scope 1 and 2 emissions by 2028[192]. The company is also establishing a Science-Based Targets initiative (SBTi) Forestry, Land and Agriculture (FLAG) target for on-farm emissions. In 2024, Synlait introduced an AgResearch tool (Life Cycle Assessment) to improve their measurement of on-farm emissions and announced a three-way partnership with Nestlé and farmer suppliers to fund innovative on-farm emissions reduction tools. These include emissions-friendly feed options and methane inhibitor technologies[193].

[190] ANZCO Foods. (2021). *Climate Change and Sustainability Report.* https://anzcofoods.com/assets/Anzco-Foods-Site-Uploads/ANZCO-Foods-2020-Climate-Change-and-Sustainability-Report.pdf
[191] Race for 2030. (2024). *Case Study.* https://racefor2030.com.au/wp-content/uploads/2024/08/ANZCO-Foods-meat-processing-Canterbury-NZ-CASE-STUDY.pdf
[192] Synlait. (2024). *Doing Milk Differently For A Healthier World.* https://www.synlait.com/wp-content/uploads/2024/11/Synlait-Integrated-Climate-Report-FY24.pdf
[193] ibid

Farming operations

As well as the agriculture processors, many farming operations across Canterbury are proactively and successfully reducing their on-farm emissions. Some examples include:

- Greenvale Pastures cropping farm near Methven reduced its nitrous oxide emissions by 11% between 2019 and 2020, and had nearly 18% less nitrogen surplus in the same timeframe. To achieve this, farm owners used a range of precision agriculture tools, including matching inputs to crop requirements, using urease inhibitors, undertaking soil mapping and regular testing, crop rotation, GPS mapping and sing crop sensors and satellite imagery[194]
- Kirikiri Farm, a coastal dairy farm south of Ashburton, reduced its GHG emissions by 9% during the 2018-2022 period. The business did this through decreasing N fertiliser which decreased nitrous oxide and carbon dioxide emissions, decreasing its stocking rate from 3.8 peak cows/ha to 3.6 peak cows/ha (which was offset by an increase in milk production/cow), and decreasing supplements fed to reduce carbon dioxide emissions – which was managed through increased pasture intake and utilisation, less processing of supplements and decreased supplements made on farm[195]
- a number of farms that are part of Synlait's Lead With Pride programme, which pays farmers a premium for their milk if they reach certain sustainability targets, including reducing on-farm greenhouse gases[196]
- a North Canterbury sheep and beef farm recently won a Ballance Farm Environment Award to acknowledge the farm's work to breed more efficient cattle with reduced greenhouse gas emissions[197].

[194] AgMatters case study: Craige Mackenzie, Canterbury | Ag Matters
[195] AgMatters case study: Dion Gordon, Canterbury | Ag Matters
[196] Synlait: Farmers - Synlait Milk and as an example, see Phill and Jos Everest, Canterbury | Ag Matters
[197] Beef + Lamb NZ: Te Mania Angus win three awards at Canterbury Ballance Farm Environment Awards | Beef + Lamb New Zealand

MANUFACTURING:

Examples of emissions reduction in the manufacturing sector are set out below. Following the table are two case studies of South Canterbury manufacturers. These case studies were undertaken to illustrate in greater detail the significant progress by some companies actively involved in reducing their GHG emissions.

Organisation	Initiative
Meadow Mushrooms Limited	Meadow Mushrooms has two locations in Canterbury, one in Christchurch and one in Dunsandel. It has replaced its diesel fired boiler at the Christchurch site with a low carbon electric option (this project was co-funded by EECA through the GIDI fund). This switch will result in a reduction in CO2 emissions of 32,675t over a 25-year lifespan, meaning an average carbon abatement of 1,307t CO2-e/year[198]. Meadow Mushrooms also moved to using electric forklifts on site, replacing petrol tractors with electric trucks, changed their growing rooms lights to LEDs, and improved insulation and the efficiency of their chilled water plant[199]. Through these initiatives the company has reduced carbon emissions by over 2,000t CO2-e per year, and is aiming to achieve net zero emissions by 2050[200]. In the next year the company will install their first solar PV array, replace existing refrigeration equipment with energy efficient SMARDT chillers and heat pumps, trial material to replace peat in the growing process, and develop a targeted plan to reduce Scope 3 emissions where possible[201].
Ravensdown Fertiliser Co-operative	Ravensdown has a 21 stores and sites in Canterbury. The company joined the Climate Leaders Coalition in 2018 and produced a carbon reduction roadmap with specific goals for fertiliser and lime.

[198] EECA. (2021). *Full steam ahead for Meadow Mushrooms' net zero carbon goal.* https://www.eeca.govt.nz/insights/case-studies-and-articles/full-steam-ahead-for-meadow-mushrooms-net-zero-carbon-goal/
[199] ibid
[200] Meadow Mushrooms. (2025). *Carbon Journey.* https://meadowmushrooms.co.nz/sustainability/carbon-journey
[201] ibid

	Ravensdown's efforts to reduce coal consumption has resulted in a 9.5% reduction in the company's total carbon footprint in over 2.5 years[202]. Through the Lime Emissions Reduction Roadmap, the company has commissioned a study into alternative fuels for driving lime in the South Island quarries. With the support of EECA, Ravensdown has identified several technically feasible, low or zero-carbon fuels which can use existing drier infrastructure or feed system. Several alternative fuels have been successfully trialled and have produced lime from the lower South Island using no coal and producing significantly less GHG emissions than usual lime production[203].
Foodstuffs South Island	Foodstuffs South Island has its headquarters in Canterbury and one of its two South Island distribution centres is located in Christchurch. There are more than 200 stores across the South Island to which Foodstuffs carries food. It has focused on reducing its refrigeration and transport emissions, including transitioning store refrigeration natural CO2 refrigerants, reducing transport emissions through route optimisations and finding more ways to optimise power usage instore. It is investigating transitioning more of its transport fleet to electric vehicles and adding more charging stations at store sites for customers[204]. A key initiative is a $27 million investment in a new automated freezer at its Christchurch distribution centre. The new freezer includes 180kW solar panels, estimated to reduce carbon emissions by more than 200 tonnes over 10 years, and will mean fewer truck movements across its supply chain network due to better onsite storage capacity[205].

[202] Ravensdown. (2025). *Carbon Reduction Roadmap.* https://www.ravensdown.co.nz/our-company/our-sustainability/carbon-reduction-roadmap
[203] ibid
[204] Foodstuffs South Island: Here for NZ
[205] Foodstuffs South Island (2024: New automated freezer at Foodstuffs Hornby distribution centre to boost capacity and meet growing demands of customers and supplier partners

CASE STUDIES:

Case study:
McCain Foods Timaru[206]

McCain Foods' Timaru site is one of its 51 potato processing factories and requires energy on-site all day to enable washing, skinning, cutting and frying.

McCain began its path to low emissions in 2019. This commenced with co-funding, alongside EECA, an energy graduate to help with data collection and be part of the team who would work through initiatives on how they could:

- reduce overall demand for steam
- switch from coal to other fuels in water boilers
- capture surplus energy from one part of the process to provide useful heat input at another (heat recovery).

McCain also considered other environmental issues such as wastewater and stormwater discharge on site.

Initial energy efficiency optimisations were installed, resulting in energy demand reductions by 18,400 GigaJoules per year. Then a decarbonisation project was carried out in 2022/23 based on conversion of Boiler No.2 from coal to wood chips. The project gained a $2.8m grant from EECA for its innovation. The resulting annual reduction of fossil-sourced carbon emission was 28,800 tonnes CO2e (250,000 GJ/year energy saving; equivalent to taking over 10,000 cars off the road). Coal is now only used for a week or two each year when the 'backup' boiler no.1 is needed, burning coal, whilst wood chip Boiler no. 2 has its annual maintenance. Avoiding the rising carbon cost of burning coal has made the transition to woodchip boiler fuel a more financially viable investment than first expected, so it may be emulated elsewhere.

[206] Case study undertaken by Rhys Taylor, Climate Change Adaptation Lead, Timaru District Council

Engineering Project Manager Lenard Smythe (left) with McCain Foods Plant Manager Jordan Jucina, displaying woodchip fuel. (photo from PotatoPro.com)

In 2022/2023 a fryer heat recovery project, also supported through EECA, utilising new technology called 'Mechanical Vapour Recompression' (MVR) from the fryer steam saved a further annual 15,200 tonnes of CO2e. The Timaru factory's MVR progress is now touted internationally, and six other McCain plants have already replicated it.

McCain also took part in the EECA-backed *Regional Energy Transition Accelerator* South Canterbury study alongside other locally-based firms.

Potential for on-site solar photovoltaics (PV) generation is being considered, but without batteries it would only help with power input for a third of their factory operating hours each day, relatively less useful than PV's role can be towards power demand at offices or education premises where most work is concentrated within daylight hours. Efficiency, to reduce 24-hour power demand, is a higher priority at present.

Conversion of gas-fuelled forklifts to electric was an easy choice, along with LED lighting throughout the factory and office spaces, but electric cars or trucks have yet to replace the diesel fuelled vehicles which haul wood chip fuel and potatoes to the plant.

However, wood pellets are transported a shorter distance than the coal (wood pellets are from Waimate, whereas the coal came from Southland), although the less-dense pellets require three times more heavy vehicle movements to deliver the same energy value. Wood pellets are made from forestry small-branch waste (slash), chipped where the trees were felled after about nine months of drying. They are only transported once. Further, McCain reports the waste from the boiler in the form of ash has gone from two truckloads of waste a week to one truck load a month, which is also composted.

Through implementing all of its energy-efficiency and low-carbon changes, McCain Foods decreased total CO2 emissions at the Timaru site by 93% which is equivalent to 39,000t CO2 per year[207].

[207] ibid

Case study

DB Breweries, Timaru[208]

DB Breweries' sustainability initiatives began with improving water efficiency. It is part of the Heineken Company, which operates internationally, including countries where freshwater is much scarcer than New Zealand (such as South Africa). Heineken has a clear policy commitment to sustainability, supported by its shareholders, with firm encouragement to its global subsidiaries and key suppliers to keep pace.

Technical investment alongside changed work practices have cut the water quantity required to make each litre of beer at the site from 6 litres to 3.18 litres by 2024, and 2.55 litres in its best month of last year. Handling less water volume means less electricity is required in pumping, refrigeration and heating. Although New Zealand grid electricity is over 80% from renewable sources, it still uses gas and coal for energy generation, especially at peak load times, and seeking efficiency is a key way to save money.

Reduced process water volumes meant less reliance on disposal to Timaru District Council's trade waste sewer and provides an opportunity to treat waste on site, so that the discharge became both a smaller and cleaner volume. Aerated treatment tanks were installed recently for a $5 million investment, assisted by Heineken's global Projects and Engineering Team.

A byproduct of the water treatment is compostable solids which are trucked in batches to the new EnviroNZ aerated composting plant in Timaru, to be mixed with garden wastes, as an alternative to previous disposal in Redruth landfill – this action converts most of the methane which could otherwise result into relatively less damaging carbon dioxide. DB is one of the first local food processors to clean-up its wastewater to this level, by meeting standards expected by its international parent company. In the 2024 calendar year, solid waste separated by the factory's wastewater treatment plant, but still damp, totalled 395 tonnes diverted from wastewater emissions previously sent to the Council's trade waste sewer and ultimately to the ocean.

Staff at the site continue to observe and report opportunities to conserve water and increase efficiency, using a phone app supplied by the firm. Ideas for productivity are encouraged at any level and in some instances, these are rewarded with financial incentives.

The beer brewing process involves alternate boiling and chilling. Technology updates have improved efficiency of the refrigeration at the factory, which circulates chilled glycol through an insulated pipe network. DB Breweries installed a more-efficient refrigeration plant in 2023 (a $1.45M investment)

[208] Case study undertaken by Rhys Taylor, Climate Change Adaptation Lead, Timaru District Council

using ammonia as the refrigerant (cycling between gas and compressed liquid states); replacing a larger volume of the R22-type refrigerant which is a damaging greenhouse gas when released to the atmosphere. It also has heat exchangers alongside the refrigeration to extract surplus heat as an input to process heat requirements elsewhere in the factory.

Adrian Finlayson of DB Breweries shows part of the Brewery refrigeration system, using ammonia as refrigerant in an outdoor-located unit. The chill is transferred by heat exchanger to less-hazardous glycol for piped circulation through the plant. Climate-warming R22 and similar gases are no longer required.

The largest contribution in the past decade to reducing other greenhouse gas emissions (carbon dioxide, nitrous oxide and methane) was DB Breweries de-commissioning two on-site coal fired boilers, to take advantage of a piped supply of steam from their Washdyke next-door neighbours, The Energy

Centre, run by Pioneer Energy renewables. The two boilers there burn woodchip, a renewable fuel from waste products of Canterbury's commercial forestry. 98% reduction in carbon emissions from heating have resulted. Encouraged by the efficiencies at the Timaru site, the DB Breweries Waitemata factory is planning to switch from gas to high-temperature electric heat pumps. As further examples of substitution of electricity for fossil fuels at DB Breweries, they purchased electric powered forklift trucks to replace LPG-fuelled ones across all their sites, and use hybrid battery-petrol vehicles to reduce fossil fuel consumption in over 90% of their sales reps' fleet.

INDUSTRY – INFRASTRUCTURE SERVICES

Organisation	Initiative
Downer Group	Downer has six offices and laboratories in Canterbury. Downer is developing a three-year Climate Change and Decarbonisation Plan to support these emissions reduction targets and is also the only large infrastructure services company to have signed the Climate Leaders Coalition[209]. The company has a programme to reduce vehicle emissions by replacing older vehicles with EVs and lighter fuel-efficient plant, aiming to transition to 100% EVs in their fleet. Following implementation of the programme in 2015, the EVs saved over three tonnes of GHG emissions in the first six months. With the recent introduction of state-of-the-art patrol/response vehicles, 500t CO2 emissions will be saved for each vehicle in its lifetime[210]. Downer has also switched to 100% emulsion for chip seal surfacing, which emits 50% less carbon than hot cut back bitumen[211].

[209] Downer. (2025). *Vehicle and emissions-based initiatives.* https://www.downergroup.co.nz/vehicle-and-emission-based-initiatives
[210] ibid
[211] Downer. (2025). *Vehicle and emissions-based initiatives.* https://www.downergroup.co.nz/vehicle-and-emission-based-initiatives

Fulton Hogan	Fulton Hogan received a $215,000 partial co-funding grant through the GIDI fund in 2023 to retrofit the Miners Road asphalt plant in Christchurch to a foaming bitumen bar. This will enable emissions reduction of approximately 277 tonnes CO2 per year[212]. Asphalt and bitumen activities at Fulton Hogan contribute to 20% of the company's emissions profile, so this switch allows for significant emissions reductions. Fulton Hogan has committed to a 30% reduction in CO2 emissions by 2030 and adopted a net zero target by 2050 from the company's 2021 baseline[213].
City Care Group	City Care operates in 16 locations across New Zealand, including Christchurch, and is part of the CCHL Group, which seeks net zero emissions by 2030, in line with Christchurch City Council targets. To achieve this, City Care's focus is on decarbonising its vehicle fleet and equipment[214]. In the 2024 financial year, all new passenger vehicles purchased were hybrid or EV[215].

[212] Scoop. (2023). *Fulton Hogan Partners Up With NZ Government To Reduce Carbon Emissions From Asphalt Production.* https://www.scoop.co.nz/stories/AK2304/S00308/fulton-hogan-partners-up-with-nz-government-to-reduce-carbon-emissions-from-asphalt-production.htm#:~:text=Fulton%20Hogan%20has%20committed%20to%20reducing%20its%20carbon,zero%20target%20by%202050%20from%20its%202021%20baseline

[213] Fulton Hogan. (2023). *Fulton Hogan Partners With Govt To Lower Asphalt Carbon Emissions.* https://www.fultonhogan.com/fulton-hogan-partners-with-govt-to-lower-asphalt-carbon-emissions/

[214] City Care Group (2024): Statement of Intent 2024-2025: Statement-of-Intent_24-25.pdf

[215] City Care Group (2024) Annual Report: Citycare-Annual-Report-2024.pdf

TRANSPORT, LOGISTICS AND FREIGHT:

Organisation	Initiative
Christchurch International Airport Limited (CIAL)	CIAL has implemented a range of large-scale emissions reduction initiatives. In 2018 it signed up to EV100, committing to becoming 100% electric by 2030. CIAL also received a grant from Christchurch Agency for Energy in 2018 to install six public EV charging stations in the airport car park and two in the staff carpark[216]. In 2020, the airport was recognised as one of the first three in the world to demonstrate best practice in carbon reduction[217]. During 2020 CIAL achieved an 83% reduction in Scope 1 emissions through installing ground source heating and cooling in the terminal building. The airport also reduced Scope 2 emissions by 27% against the 2015 baseline year through LED replacements and improved energy efficiency[218]. Aircraft ground power was installed at the airport, which means aircraft can use electricity instead of jet fuel when on the ground, saving approximately 730t CO_2-e per plane per year[219]. In the 2022 financial year, CIAL achieved net zero in their Scope 1 and 2 emissions from a 2014 baseline with 94% absolute GHG emissions reductions[220]. CIAL plans to have an absolute zero emissions target for Scope 1 and 2 emissions by 2035, and a stakeholder partnership plan to support Scope 3 reductions. The airport also aims to achieve net zero in Scope 3 by 2050. In 2021, the airport set aside 400 hectares of its Harewood campus to develop Kōwhai Park. As noted earlier, phase 1 of the park will deliver 220-hectare solar array with capacity of generating 150 megawatts of electricity[221]. The project will help meet increased energy demand and provide a resilient supply of renewable energy for Canterbury. Kōwhai Park is expected to generate

[216] Christchurch Airport. (2025). *Doing a power of good.* https://www.christchurchairport.co.nz/about-us/sustainability/energy/
[217] Christchurch Airport. (2020). *Christchurch Airport gains world first recognition.* https://www.christchurchairport.co.nz/about-us/who-we-are/media/2020/christchurch-airport-gains-world-first-recognition/
[218] ibid
[219] ibid
[220] Christchurch Airport. (2023). *Climate Policy.* https://www.christchurchairport.co.nz/globalassets/about-us/sustainability/carbon/climate-policy.pdf
[221] Ōtautahi Christchurch. (2021). *Net Zero 2050 – Christchurch Airport announces 'innovative and world leading' renewable energy park.* https://www.christchurchnz.com/news/net-zero-2050-christchurch-airport-announces-innovative-and-world-leading-renewable-energy-park#:~:text=Christchurch%20Airport%20is%20committing%20400%20hectares%20of%20its,enable%20businesses%20to%20transition%20away%20from%20fossil%20fuels

	low carbon energy by 2026, and in August 2024 both Contact Energy and Lightsource confirmed their investment in the solar farm as construction began[222]. Other current emissions reduction initiatives underway at Christchurch International Airport include: • decommissioning the last of the airport's diesel and LPG boilers • converting the entire corporate vehicle fleet to EV alternatives • introducing autonomous vehicle sharing programmes • implementing large scale onsite renewable energy for both the airport and the campus by 2025[223].
Lyttelton Port Company (LPC)	The Lyttelton Port is the largest in the South Island and facilitates the movement of $5 billion of exports and $5 billion of imports each year. In 2016, LPC established MidlandPort in Rolleston to consolidate and transfer freight by rail between Lyttleton and Rolleston. This has reduced the amount of daily one-way truck trips between Rolleston and the Port, resulting in reduced carbon emissions for customers and providing a sustainable logistics solution[224]. For some customers, using the inland port as part of their supply chain has reduced their carbon emissions by 50%[225]. LPC's Sustainability Strategy includes a target of net-zero carbon emissions by 2050. The LPC has a carbon emissions reduction plan which includes implementing lower emissions large plant practices in the container terminal, prioritising fuel-efficient diesel-electric Noell straddles and decommissioning older less fuel-efficient straddles [226]. LPC reviewed its emissions reduction plan in 2023 and identified five significant reduction opportunities to replace diesel-powered plant and equipment with electric alternatives[227]. The LPC also began developing a framework to reduce embodied carbon in infrastructure projects in the 2023 financial year. LPC's current focus is indirect emissions reporting and considering reduction targets for Scope 3 emissions.

[222] Christchurch Airport. (2024). *Construction to begin on one of NZ's largest solar farms.* https://www.christchurchairport.co.nz/about-us/who-we-are/media/2024/construction-to-begin-on-one-of-nzs-largest-solar-farms/
[223] Christchurch Airport. (2025). *Focus on climate.* https://www.christchurchairport.co.nz/about-us/sustainability/climate/
[224] Climate Leaders Coalition. (2019). *Carbon calculator for lower freight emissions.* https://climateleaderscoalition.org.nz/wp-content/uploads/2022/06/2019-08-20-LPC-Case-Study.pdf
[225] Lyttleton Port Company. *Sustainability: Our Carbon Footprint.* https://www.lpc.co.nz/our-carbon-footprint/
[226] Lyttleton Port Company. *Sustainability: LPC Sustainability Strategy.* https://www.lpc.co.nz/lpc-sustainability-strategy/
[227] ibid

PrimePort Timaru	PrimePort Timaru has been mapping its carbon emissions since 2021, and for energy efficiency purposes has installed LED light towers around the port. It is closely watching technological advancements relating to shore power and renewables elsewhere for opportunities to reduce its emissions[228].
Tāwhaki National Aerospace Centre	The Tāwhaki National Aerospace Centre located at Kaitorete in Canterbury is exploring renewable energy transition projects. Tāwhaki is partnering with liquid hydrogen solutions company Fabrum to investigate renewable energy production via solar power, hydrogen production and storage options, and providing energy backup systems to the grid from Kaitorete[229] . The collaboration agreement prioritises clean and renewable energy production options such as integrated solar power grid farming and green hydrogen. Tāwhaki considers making green hydrogen accessible to Kaitorete will encourage operations to trial green fuel options for both aerospace and marine transportation, and accelerate a low emissions future[230].
KiwiRail	In 2024, KiwiRail supported a new rail hub in Ashburton to improve safety and traffic flows in the town alongside reducing GHG emissions by moving freight off South Island roads[231]. The project is a joint initiative with the Ashburton District Council and Fairfield Freight Hub Ltd. The new rail hub encourages more freight to rail and will be able to increase local freight from 6,000 containers to 20,000 containers a year[232] . This will remove the need for approximately 40,000 truck movements annually, significantly reducing transport emissions. KiwiRail is also currently testing two low-emissions locomotives at its Middleton depot in Christchurch. The new locomotives have the potential to reduce fleet CO2 emissions by 20 to 25% through reduced fuel burn and use of onboard technologies. The remainder of the new fleet of low-emissions trains will arrive in New Zealand during 2025 and 2026, with 47 of the fleet of 66 going to the South Island[233]. KiwiRail has also signed a memorandum of understanding with the Selwyn District Council to develop a freight hub in Rolleston. The location, cost and timeframe for development of a hub is yet to be decided[234].

[228] PrimePort Timaru. (2024). *PrimePort Timaru Annual Report 2024.* *Primeport_AR_2024_WebReady.pdf*
[229] Tāwhaki. (2023). *Tāwhaki and Fabrum exploring clean energy options for aerospace innovators and communities*. https://tawhaki.co.nz/tawhaki-and-fabrum-exploring-clean-energy-options-for-aerospace-innovators-and-communities/
[230] ibid
[231] Transport Talk (2024): New Fairfield Freight Hub opens | TRANSPORTtalk: Truck and Industry Equipment News
[232] KiwiRail. (2021). *New Ashburton rail hub welcomed.* https://www.kiwirail.co.nz/media/new-ashburton-rail-hub-welcomed/
[233] NZ Herald (2024): KiwiRail unveils new state-of-the-art, low emission trains - NZ Herald
[234] Star News (2024): Large freight hub could bring big benefits to Canterbury | Star News

Canterbury-based freight and logistics businesses

As well as the airports, ports and KiwiRail, the Canterbury freight network also includes a number of significant freight and logistics companies, many of which are implementing emissions reduction initiatives. For example:

- Bascik Transport is a certified Toitū Carbon Reduce company and works with customers to provide multi-modal freighting options across New Zealand, including rail and coastal shipping. It has also developed an in-house carbon emissions calculator to support customers to understand their carbon emissions[235]
- NZPost, although not a Canterbury-based entity, operates nationwide and is working towards 100% electric vehicles in its fleet by 2025. It is also currently trialling four different types of low-emissions heavy freight vehicles in the North Island (covering electric, battery and hydrogen)[236].
- Hilton Haulage is also a certified Toitū Carbon Reduce company, and is working to establish reduction targets, pathways and plans. As well as investigating electric forklifts and hybrid trucks, it is also concentrating on efficiency in its fleet, having invested in modern trucks with engines burn fuel twice, resulting in a cleaner combustion[237]. Hilton Haulage has also partnered with Swire Shipping NZ to create a low-emissions supply chain for heavy freight by linking zero emission battery-swapping, fully electric trucks with coastal shipping – operating an XCMG E700 electric truck from Lyttelton Port to Coca-Cola Europacific Partners' site in Christchurch[238].

[235] Bascik Transport: Reducing environmental impact to transport goods in NZ - Bascik Transport
[236] NZPost: Electric vehicles powering deliveries | NZ Post
[237] Hilton Haulage (2024): ESG Report 2024: Hilton-Haulage-ESG-Report-PDF-April-2024.pdf
[238] Swire Shipping NZ (2024): Pacifica Shipping Combines Battery Electric Trucks with Coastal Shipping for Low Emission Supply Chain - Swire Shipping | Specialist Logistics Solutions and Pacifica Shipping introduces battery swap e-trucks | Innovatek

EDUCATION AND RESEARCH:

Organisation	Initiatives
Lincoln University	Lincoln has committed to phase out coal fired power generation at its site in 2025, and diesel generators will be phased out by 2030[239]. In 2023, Lincoln achieved its target of purchasing electricity from 100% renewable sources[240]. Lincoln has also collaborated with ECan and other partners to increase the effectiveness of public transport to and from campus to reduce travel-related CO2 emissions[241]. The university has also received funding from Orion's Energy Accelerator programme to build an Energy Farm on university-owned land adjacent to the Lincoln campus. The farm's 1.5MWp solar instillation will generate approximately 2.3GWh of renewable energy annually. The Energy Farm will be the first demonstration of high-value agrivoltaics in New Zealand and is scheduled for completion in mid-2025. The farm will cover approximately 18% of the campus's annual electricity requirements and contribute to LU's carbon neutral and carbon zero targets[242]. The university is also heavily involved in research to support reducing New Zealand's agricultural emissions. Recent examples include: • in partnership with Ravensdown, trialling and developing a new technology to reduce on-farm methane emissions in effluent ponds using the EcoPond effluent treatment system[243] • testing an extract from daffodils that was found in UK research to reduce emissions from livestock[244] • research into barriers faced by sheep farms in adopting sustainable practices[245].

[239] Lincoln University. (2023). *Sustainable Development Goals Report.* https://www.lincoln.ac.nz/assets/Sustainability/Lincoln-University-SDG-Report-2023.pdf
[240] Lincoln University. (2023). *Summary of Toitū Carbon Reduce Certification.* https://transporttalk.co.nz/news/new-fairfield-freight-hub-opens
[241] Lincoln University. (n.d.). *Sustainability Plan.* https://www.lincoln.ac.nz/assets/Publications/LIN3556-Sustainability-Plan.pdf
[242] Lincoln University. (2024). *Energy Farm will be first in New Zealand to demonstrate high-value agrivoltaics.* https://www.lincoln.ac.nz/news-and-events/energy-farm-will-be-first-in-new-zealand-to-demonstrate-high-value-agrivoltaics/
[243] Lincoln University (2024): Advancing technology: New project targets methane reduction in dairy effluent ponds :: Lincoln University
[244] Lincoln University (2024): Methane-blocking extract from daffodils to be trialled at Lincoln :: Lincoln University
[245] Lincoln University (2023): Sheep farmers need help to become sustainable

AgResearch	AgResearch's corporate office and laboratory facility in Lincoln has been designed to reduce emissions by utilising natural ventilation and the structure is designed with timber framing and light-weight cladding which has saved nearly 80% of CO2 emissions (compared to a steel and concrete build)[246]. As New Zealand's Crown Research Institute dedicated to research on the pastoral sector, AgResearch has a large focus on supporting the reduction of agricultural emissions. Key recent successes or research under way includes: • tools to enable breeding low-emissions sheep and cattle[247] • research (with partners Bioresource Processing Alliance, Fonterra, Alps 2 Ocean Foods, Alliance Group, and Pāmu) showing that beef produced from cattle from New Zealand's dairy sector could provide reductions in greenhouse gas emissions of up to 48 per cent[248] • methane vaccine research[249] • research and trials on lower methane feeds such as high metabolisable energy ryegrass and high-condensed tannin white clover[250]. The Government announced earlier in 2025 that it would be merging the current Crown Research Institutes into three public research organisations later this calendar year[251]. AgResearch will be merged with Manaaki Whenua – Landcare Research, Plant and Food Research, and Scion, with the work of this public research organisation focused on the bioeconomy[252].
University of Canterbury	The University of Canterbury's energy efficiency programme has achieved a 23% reduction in the university's CO2 emissions between 2010 and 2019. The university has a strategic objective to reach net zero carbon emissions by 2030, which will be achieved through:

[246] AgResearch. (2023). *New AgResearch facility opens in Lincoln.* https://www.agresearch.co.nz/news/new-agresearch-facility-opens-in-lincoln/
[247] AgResearch (2023): New tech to boost emissions reduction efforts - AgResearch
[248] AgResearch (2024): Dairy-beef offers potential for significant emissions savings - AgResearch
[249] AgResearch (2025): Backing the science on methane reduction - AgResearch
[250] AgResearch (2025): Submission on Gene Technology Bill: AgResearch-Gene-Tech-Bill-submission-17-Feb-2025.pdf
[251] Minister of Science, Innovation and Technology (2025): Unlocking economic growth through science | Beehive.govt.nz
[252] AgResearch (2025): Government announces changes to science system - AgResearch

	• replacing coal with biomass for a heating fuel, which will reduce space-heating emissions by 80% or 9000 tonnes of CO2 emissions • continuing to improve building energy efficiency and heating a group of buildings which electricity-powered ground source heat pumps[253]. The university has also contributed to low-emissions research, with recent examples including: • exploring using waste materials to decarbonise iron and steel production[254] • carbon removal and storage options and solutions[255] • developing carbon-negative green hydrogen[256] • exploring how to reduce carbon emissions by improving energy efficiency in large buildings[257].

[253] University of Canterbury. (n.d.). *Energy and carbon.* https://www.canterbury.ac.nz/life/sustainability/sustainability-office/sustainable-operations/energy-and-carbon
[254] University of Canterbury (2025): NZ study tackles sector causing 7% of global CO_2 emissions | University of Canterbury
[255] University of Canterbury (2024): UC research curbing our carbon conundrum | University of Canterbury
[256] University of Canterbury (2023): Creating carbon-negative 'green' hydrogen to fuel our world | University of Canterbury
[257] University of Canterbury (2023): Building smarter to help cut NZ's carbon emissions | University of Canterbury

WASTE SECTOR:

Organisation	Initiatives
Transwaste Canterbury	Transwaste Canterbury is a joint venture between Christchurch City, Selwyn, Ashburton, Waimakariri and Hurunui district councils, and Waste Management Limited. It runs the Kate Valley landfill, which manages all waste from partner councils, as well as neighbouring Tiromoana bush conservation area[258]. Its Statement of Intent notes that it has outcomes and performance measures that cover reporting on gross and net GHG emissions from the waste delivered to the landfill as well as the GHGs created through the handling of the waste at the landfill for each of the five partner councils[259]. During the 2023/24 year, Transwaste captured and disposed of 96% of the landfill gas generated by using it for electricity production or by flaring of the surplus landfill gas. Its 2024 annual report notes that total potential GHG emissions (including those from fleet and plant operations) were 303,822 tonnes of CO2 equivalent. Of this, 287,382 tonnes were destroyed by flaring, electricity generation or otherwise oxidized. A further 6,804 tonnes were offset by carbon sequestration in the forests owned and managed by Transwaste, which was greater than the company's total emissions from diesel[260].
Ecogas	In December 2023, Christchurch City Council confirmed Ecogas as the new long-term organics processor for Christchurch's organic waste. Ecogas has a resource consent application under consideration for the operation of its new processing facility. The facility proposes to use anaerobic digestion technology and a biomass processing line to convert mixed kerbside organics and garden waste into renewable energy, fertiliser, biogas, and biomass. If the consent application is approved, Ecogas intends to begin accepting all food and green waste collected from kerbside green bins in Christchurch, as well as other commercial and industrial waste, from the second half of 2026[261]. The proposed Christchurch facility has the capacity to receive 100,000 tonnes of organic waste every year[262].

[258] Transwaste Canterbury (2024). Annual report: Microsoft Word - Transwaste Canterbury Ltd - 2024 Annual Report final signed without auditors opinion.docx
[259] Transwaste Canterbury (2025). Statement of Intent: https://transwastecanterbury.co.nz/wp-content/uploads/2025/03/Transwaste-SOI-2025-FINAL.pdf
[260] Transwaste Canterbury (2024). Annual report: Microsoft Word - Transwaste Canterbury Ltd - 2024 Annual Report final signed without auditors opinion.docx
[261] Environment Canterbury (2025): Ecogas - Ōtautahi/Christchurch Organics Processing Facility | Environment Canterbury
[262] Ecogas website: Otautahi Christchurch Organics Processing Facility — Ecogas

COMMUNITY GROUPS AND ORGANISATIONS:

A range of community groups and organisations in Canterbury are implementing emissions reduction initiatives. The scale of these initiatives differs depending on the organisation and their financing ability and capacity. To complete the picture of emissions reduction initiatives in the region, some examples of efforts by local community groups or organisations are provided to give insight into the ways in which local government or industry can best partner with these groups to support their aspirations:

- MyNativeForest has planted 2.5 hectares of trees in Banks Peninsula's Purau Bay. When this site is fully planted it has the potential to sequester approximately 10,000 tonnes of CO2, alongside hosting bird species, wildlife and forming erosion protection[263]
- The Terra Nova Foundation runs a free programme for not-for-profits designed to empower community organisations to reduce emissions, increase their climate resilience and consider the environmental impact of their work. The programme includes access to a carbon emissions measurement tool and advice on reduction strategies specific to the community organisation[264]
- Satisfy Food Rescue is based in North Canterbury and aims to re-direct food in the community to where it is needed locally. In 2023 the total food distributed by the organisation surpassed 1 million kilograms[265]. By diverting food waste from landfill and using a compost system, the organisation saved 1,217m litres of water and 1,732 tonnes of CO2 -e in the 2024 financial year[266]
- Six community-based organisations in Canterbury have received funding from the Meridian Community Decarbonisation Fund 2024 round to implement solar and EV projects. Five of the organisations received funding for solar projects, and the sixth received funding for an EV project[267].

GAPS ACROSS THE REGION

In assessing the examples above, a number of gaps become clear across each of the categories. Some important gaps to be aware of when developing a transition plan for the region are identified below. For all sectors, access to funding and financing remains a key gap.

For transport:

- while the government is focused on creating market-led private investment in hydrogen, there is still considerable progress that needs to be made before hydrogen vehicles are available to use (and in suitable quantities) to contribute to the low-emissions transition in Canterbury

[263] Ōtautahi Christchurch. (2025). *MyNativeForest*. https://www.christchurchnz.com/business/success-stories/mynativeforest
[264] Terra Nova. (2025). *Earth+ NfP Programme.* https://terranova.foundation/our-work/nfpprogramme/
[265] Satisfy Food Rescue. (2024). *Annual Report 2024.* https://www.satisfyfoodrescue.org.nz/post/enjoy-our-2024-annual-report-1
[266] Satisfy Food Rescue. (2024). *Homepage*. https://www.satisfyfoodrescue.org.nz/
[267] Auckland Scoop. (2024). *Kiwi Community Groups Receive Big Boost For Electrification Efforts*. https://auckland.scoop.co.nz/2024/11/kiwi-community-groups-receive-big-boost-for-electrification-efforts/

- the ERP seeks to enable a network of 10,000 EV charging points by 2030; however the installation rate of these is currently slow, and there is a lack of incentives for investment[268]
- some larger (national or international) transport, freight and logistics companies (such as Mainfreight[269]) have clear emissions reduction plans, but this is lacking in smaller, regionally based companies who have fewer financial resources
- continued focus needs to remain, and in many areas increased, on providing and incentivising convenient alternatives to private cars
- withdrawing the central government clean car discount and implementing road user charges for EVs has contributed to a clear drop off in the number of EVs purchased for individual/household transport[270], and this has not recovered. This demonstrates how crucial behaviour change is to support mode shift at an individual and community level – for non-fossil fuel cars but also for public transport, walking and cycling initiatives
- for aviation, there is a gap in the affordability and availability of sustainable aviation fuels.

For manufacturing:

- most companies used as examples in the industry sub-categories are included in the top 100 highest GHG emitting companies in Canterbury. Yet, many other high emitting companies on this list have not implemented emissions reduction actions/targets or have done so at a very small scale
- lack of central government funding furthers the gap for emitters to make progress as it will be more challenging for some companies to access required finance, and companies will need to explore other options, which may delay the speed of large process heat users transitioning to low-emissions options
- process heat users may need improved information from biomass suppliers and electricity network owners about matters such as demand, load, supply and emission impacts of transporting biomass, to support making decisions about switching fuel
- funding streams from central government have changed significantly since 2023; the Government Investment in Decarbonising Industry (GIDI) Fund is a key example – this is no longer available, but was used by many manufacturers to support their investment in transitioning to clean energy.

For agriculture:

- pricing agricultural emissions in 2030, instead of 2025, means some farmers may be less incentivised to manage their emissions in the next few years, resulting in lost opportunities to reduce emissions over that period
- while a range of tools and technologies to reduce on-farm emissions are available now, there are a significant number that are in development and may take some time to be trialled, tested and commercialised.

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[268] Gibson, E. (2024). *NZ at bottom of league table for EV chargers: 'We really need to lift our game'.* RNZ. https://www.rnz.co.nz/news/national/521633/nz-at-bottom-of-league-table-for-ev-chargers-we-really-need-to-lift-our-game

[269] Mainfreight: Sustainability In Mainfreight

[270] EVBD (2025). EV Market Stats 2025: EV Market Stats 2025

For councils:

- Canterbury councils are all at different stages in developing climate mitigation actions. Some councils could lean on the experience of others to make progress with their climate aspirations, especially when it comes to engaging with their local communities on emission reductions or accessing climate-focused finance or funding for climate mitigation actions
- most Councils have not implemented reduction efforts focused on emissions at the city or district scale and would require support and guidance to achieve this.

Like councils, the Papatipu Rūnanga are all at different stages in developing emissions reduction actions. There may therefore be gaps in alignment between the climate goals and actions of rūnanga and the local council.

These gaps are considered in Chapter 6 of the Overview, which looks at the options for the transition, and where the barriers, risks, and opportunities are in the transition to a low-emissions region.

5 International influences on Canterbury's low-emissions transition

Key technological innovations, climate policies and international agreements, consumer expectations and political influences impact multiple high-emitting sectors in New Zealand and will affect the speed and nature of Canterbury's low-emissions transition. These include developments in carbon capture and storage technologies, policy decisions and involvement in international climate agreements by large emitters, and carbon pricing mechanisms. Sector-specific international influences also have substantial implications for Aotearoa, particularly for the agriculture industry.

These influences clearly illustrate the importance of New Zealand keeping well-informed of policy developments, investing in and trialling emerging technologies, and taking advantage of key market drivers and trends internationally to accelerate our low-emissions transition and ensure cost-effective, long-term emissions reduction solutions.

An assessment of key international influences is set out below.

Domestic climate policies of other nations

UNITED STATES OF AMERICA

In early 2025 the United States of America withdrew from international climate commitments including the Paris Agreement, and intends to amend domestic climate policies, including expanding fossil fuel production and removing tax credits for electric vehicles[271]. These decisions could have a significant impact on the direction of climate policy, ambition and commitments by other countries. For example, Argentina is considering withdrawing from the Paris Agreement following the announcement by the United States[272]. The United States' decision also influenced conversations in New Zealand, with international reporting of a Cabinet minister's comments suggesting New Zealand should look to reconsider being party to the agreement[273].

From a New Zealand perspective, reductions in climate ambitions by the United States may result in less public appetite here for emissions reductions, or mean that there are fewer opportunities for us to participate in ambitious international partnerships and agreements. However, it could also mean that countries committed to climate action are more likely to be able to progress climate negotiations, collaborative initiatives and other agreements together, without interference by nations that are less committed.

[271] Walling, M. (2025). *What to know about Trump's first executive actions on climate and environment.* https://apnews.com/article/trump-executive-orders-climate-change-environmental-policy-e4fb2b2495c0bcf880fab46605936b09

[272] Buenos Aires Times (2025): Milei says he's considering taking Argentina out of Paris Agreement | Buenos Aires Times

[273] See New Zealand Coalition Partner Floats Quitting Paris Agreement - Bloomberg

CHINA

As well as the United States, China is highly influential in international climate negotiations and emissions reduction initiatives as the world's largest contributor to global GHG emissions. China's stance on climate diplomacy often determines other countries' involvement in and contribution to climate mitigation efforts.

China dominates the global EV market, is the largest producer of hydrogen, has over one hundred carbon capture and storage demonstration projects in planning or operation, and has implemented ambitious strategies to reduce emissions from the iron and steel industry[274]. The Chinese government introduced a low carbon transformation plan in 2024 to reduce emissions from existing coal plants through biomass co-firing, carbon capture and storage technologies and green ammonia co-firing[275]. In 2024, China's CO2 emissions dropped due to a surge in clean energy additions, and the country reduced its coal plant permits by 83%[276]. China also introduced new regulations on ETS management in 2024 and plans to expand its ETS to include key high-emitting sectors.

These strong domestic policies influence global markets and climate agreements involving China and set the tone for international climate action. China is an important climate partner for New Zealand, and cooperating on climate change has been a key element of the relationship between the two countries[277]. As New Zealand is committed to strengthening cooperation with China in climate areas including carbon markets and nature-based climate solutions, any changes to Chinese policy related to emissions reductions will impact New Zealand. This relationship may result in additional opportunities to increase renewable energy and drive low emissions policies in New Zealand, which will impact regional shifts including the pace of Canterbury's low emissions transition.

EUROPE

The EU was the world's fourth largest greenhouse gas emitter in 2023, after China, the United States and India[278]. It remains committed to its 2050 carbon neutrality goal, and has continued to decrease its greenhouse gas emissions since 1990 – in 2023, net emissions were 37% below 1990 levels[279].

The EU's 2005 Emissions Trading Scheme (ETS) was the world's first international emissions trading scheme (New Zealand followed in 2008) and the EU plans to introduce a new ETS in 2027 to target additional industrial sectors alongside fuel distribution for roads and buildings[280].

[274] The Administrative Center for China's Agenda. (2024). *China's Carbon Capture Utilization and Storage (CCUS): Development Status and Prospect.* https://usea.org/sites/default/files/event-/2024-6-5-Chinas%20CCUS%20Development%20Status%20and%20Prospect.pdf
[275] Climate Action Tracker. (2024). *China.* https://climateactiontracker.org/countries/china/policies-action/
[276] ibid
[277] New Zealand Government. (2024). *New Zealand, China hold high-level climate change talks.* https://www.beehive.govt.nz/release/new-zealand-china-hold-high-level-climate-change-talks
[278] European Parliament website (2024): Climate change in Europe: facts and figures | Topics | European Parliament
[279] See Progress on climate action - European Commission
[280] Clean Energy Wire. (2024). *Understanding the European Union's Emissions Trading Scheme (EU ETS).* https://www.cleanenergywire.org/factsheets/understanding-european-unions-emissions-trading-system?

A key policy position in Europe that may influence the speed of low-emission and electric vehicle take-up in New Zealand is the recently reaffirmed commitment to ensuring by 2035 that no new fossil-fuel based vehicles can enter EU markets, and maintaining its focus on C02 targets between now and then to achieve this[281]. In addition, a number of tools and other innovations to reduce methane emissions from agriculture are the focus of current research in EU countries, with tools such as Bovaer already available for use in many countries[282] . The speed with which some of these tools can be trialled and implemented successfully may influence how quickly agricultural emissions can be reduced in New Zealand. This is covered in more detail in the agriculture section below.

International carbon pricing mechanisms and emissions trading schemes

Carbon pricing mechanisms are instruments that capture the external costs of GHG emissions and tie them to their sources through a price (usually in the form of a price on the CO2 emitted)[283].

There is increasing recognition of the fundamental role of carbon pricing in low emissions transitions, and carbon pricing mechanisms are an essential tool used by governments to reduce emissions. At COP29 in 2024, key rules governing the trade of carbon credits were approved to facilitate greater international cooperation by allowing countries to fund climate initiatives overseas. Article 6.2 allows countries, corporations and individuals to trade emissions reduction units, with Article 6.4 establishing a centralised carbon market under UN supervision[284]. While some concerns have been raised about the approval process, speed and the robust safeguards required to ensure the integrity of these markets[285], the new regulations will allow countries including New Zealand to realise greater emissions reductions through trading reduction units and funding international climate mitigation initiatives.

The two main direct carbon pricing mechanisms are carbon taxes and emissions trading schemes (ETS). As of 2024 there are 36 jurisdictions worldwide which have officially implemented an ETS[286]. Some countries have more comprehensive ETSs, with South Korea's covering 23 sectors and accounting for approximately two thirds of the country's emissions[287]. The developments to carbon pricing mechanisms and advancements to different countries' ETSs reflect global commitment to emissions reduction strategies. New Zealand may face growing pressure to reform our ETS and land

[281] European Commission (2025): Press statement by the President on the Strategic Dialogue on the Future of the Automotive
[282] AgResearch (2025): Backing the science on methane reduction - AgResearch
[283] World Bank Group. (2025). *Carbon Pricing Dashboard.* https://carbonpricingdashboard.worldbank.org/what-carbon-pricing
[284] Carbon Credits. (2024). *COP29 Key Outcomes: Milestones, Setbacks, and What Comes Next for Global Climate Action.* https://carboncredits.com/cop29-key-outcomes-milestones-setbacks-and-what-comes-next-for-global-climate-action/
[285] Niranjan, A. (2024). *Critics say approval of 'climate credits' rules on day one of COP29 was rushed.* https://www.theguardian.com/environment/2024/nov/11/critics-say-approval-of-climate-credits-rules-on-day-one-of-cop29-was-rushed?
[286] Homaio. (2024). *Do other countries have an emissions trading scheme (ETS)?* https://www.homaio.com/post/do-other-countries-have-an-emissions-trading-scheme-ets
[287] International Carbon Action Partnership. (2025). *Korea Emissions Trading Scheme.* https://icapcarbonaction.com/en/ets/korea-emissions-trading-scheme

use regulations, particularly as the current scheme does not include agriculture. Advancements in carbon pricing mechanisms may also drive emissions reductions in Aotearoa and the Canterbury region. It is important for New Zealand's ETS to remain internationally competitive, and Aotearoa may be influenced to utilise the approved carbon credit trading policies to achieve greater emissions reductions.

Innovations in carbon capture and storage

Research into low-emissions advancements focuses on the main emitting sectors and industries, and governments increasingly rely on such technologies to meet emissions reduction targets and international agreements. Carbon capture and storage is one such innovation in climate mitigation. Carbon capture and storage refers to technologies that capture CO2 from industrial processes and store it underground. The process involves separating CO2 from other gases during industrial production, compressing and transporting it to storage sites and then injecting the CO2 into geological formations to be stored long term[288].

As of 2024, 50 carbon capture and storage facilities are in operation globally, with hundreds more in the early and advanced development stages[289]. Many countries have projected the use of carbon capture and storage as essential in their strategies for achieving domestic and international climate targets. As New Zealand has relatively few point sources of CO2 the rationale to adopt carbon capture and storage is different from other countries, but it has been identified as a viable option for large emitters in New Zealand in the future[290]. A number of potential sites for carbon capture and storage have been identified, but additional legislation is required to manage the complexities of the technology, and the emissions trading scheme would need to be amended to make carbon capture and storage a recognised removal source. Australia has an operating commercial facility which has stored over nine million tonnes of CO2 since December 2023, and the country has 15 more CO2 storage projects in development[291]. If New Zealand were to develop a carbon capture and storage facility it could be advantageous to align with Australia's approach in terms of having a 15-year closure assurance period to allow sufficient monitoring and ensure the integrity of the storage site[292].

While there are many potential barriers and risks to consider, a carbon capture and storage facility in Canterbury could provide opportunities for emissions removals from multiple sectors. Continuing innovation overseas and the increasing number of carbon capture facilities globally may influence the speed with which New Zealand chooses to develop and invest in these facilities, particularly as

[288] British Geological Survey. (2025). *Understanding Carbon Capture and Storage.* https://www.bgs.ac.uk/discovering-geology/climate-change/carbon-capture-and-storage/
[289] Statistica. (2024). *Number of commercial carbon capture and storage (CCS) facilities worldwide in 2024, by status.* https://www.statista.com/statistics/726624/large-scale-carbon-capture-and-storage-projects-worldwide-by-status/
[290] New Zealand Productivity Commission. (2018). *Low-emissions economy.* https://www.treasury.govt.nz/sites/default/files/2024-05/pc-inq-lee-productivity-commission-low-emissions-economy-final-report-final-2.pdf
[291] Geoscience Australia. (2024). *Carbon Capture and Storage.* https://www.ga.gov.au/aecr2024/carbon-capture-and-storage
[292] Russel McVeagh. (2024). *Thoughts on a Carbon Capture Utilisation and Storage framework for New Zealand.* https://www.russellmcveagh.com/insights-news/thoughts-on-a-carbon-capture-utilisation-and-storage-framework-for-new-zealand/

carbon capture, utilisation and storage is a key policy in the Government's current Emissions Reduction Plan.

Agriculture sector

TECHNOLOGICAL INNOVATIONS:

Given agricultural emissions constitute nearly half of New Zealand's gross GHG emissions, and the agriculture sector's dominance in the Canterbury region, assessing emerging innovations in this sector ensures Aotearoa remains a competitive producer.

In recent years there has been significant technological advancements in agriculture, with developments in both methane reduction technologies and solutions to improve the efficiency of agriculture production systems. Methane reduction technologies are most applicable to New Zealand's agriculture system and these include the use of feed additives, selective breeding for low-emitting animals, developing methane reducing vaccines and inhibitors, and gene editing. The following examples highlight emerging research in each area which may impact the transition to low-emissions options in Canterbury and New Zealand:

- In 2022, Dutch company DSM received approval to market its methane-reducing feed additive Bovaer in the European Union. The feed additive has been shown to reduce methane emissions in dairy cows by approximately 30% and approximately 45% in beef cattle. The feed additive also received regulatory approval in the United States in 2024[293].
- Scotland's Rural College, Semex and Paragon Vets are partnering in a project called Cool Cows which involves breeding methane-efficient cattle through IVF[294]. The first methane-efficient calf in this trial was born in 2025 and scientists will assess further generations of cows to ensure sufficient progress and reduced methane emissions.
- The Pirbright Institute and Royal Veterinary College in the UK are testing the potential of a methane reduction vaccine which could reduce livestock emissions by over 30%[295]. New Zealand Crown Research Institute AgResearch is involved with this project to provide expertise in rumen microbiology and vaccine development.
- UC Berkeley, UC Davis and UC San Francisco are partnering on a research project using the CRISPR gene-editing tool to modify microbial populations in cows' rumen to reduce methane emissions[296]. The research envisions a long-term methane reduction treatment which can be given to calves to reduce methane emissions throughout the cows' lives[297].

[293] Time. (2024). *Reducing Cattle's Foodprint: The Best Innovations of 2024.* https://time.com/7094797/dsm-firmenich-bovaer/
[294] Improve Veterinary Education. (2025). *Could this calf hold the key to reducing methane emissions*? https://www.veterinary-practice.com/2025/could-this-calf-hold-the-key-to-reducing-methane-emissions
[295] The Pirbright Institute. (2024). *Global quest for vaccine to cut methane in cattle.* https://www.pirbright.ac.uk/news/global-quest-vaccine-cut-methane-cattle
[296] UC Davis. (2023). *Can CRISPR Cut Methane Emissions From Cow Guts?* https://www.ucdavis.edu/food/news/can-crispr-cut-methane-emissions-cow-guts
[297] ISAAA. (2023). *Inter-UC Project to Cut Livestock Methane Emissions Using CRISPR Gut Microbes.* https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=20158

New Zealand funds and conducts substantial research into technological innovations to reduce emissions from the agriculture sector, due to our reliance on agriculture as a key contributor to GDP. This is critical as there are some significant differences in agricultural systems, one being the pasture based grazing system in Aotearoa differs from the more common feed-based systems seen in regions like Europe. This results in reduced applicability for some innovations. For example, the methane-reducing feed additive Bovaer must be included in the daily dry feed of animals, making implementation of the additive challenging for most farmers in New Zealand as they graze their stocks.

MARKET DRIVERS:

Consumer behaviour and changing attitudes towards sustainability are impacting the agricultural sector and influencing policy decisions. As there is growing awareness of climate change and consumers are prioritising sustainable food choices, the demand for plant-based items, sustainability certified, and low-emissions agricultural products is increasing[298]. The EU has the strongest regulations for low-carbon food products and many other countries are beginning to implement sustainability food certifications[299]. To align with global trends and ensure New Zealand's agriculture products remain competitive, New Zealand may need to implement national sustainability certifications for agriculture products or investigate low emissions options. As agriculture is a key industry in the Canterbury region this would increase the emissions reduction options available to drive the transition to a low emissions future.

A recent example of international influences shaping changes in New Zealand is Fonterra's announcement to pay farmers that meet certain climate criteria an extra 1-5 cents per kilogram of milk solids[300]. An additional 10-25 cents per kilogram is available to farms whose emissions are around 30 percent lower than average. Funding for the higher payments is coming from Mars and Nestle as part of those companies' climate commitments, and the two companies are also offering further funding through Fonterra for farms wanting to improve genetics or try new technologies. Fonterra has advised these incentives to reduce emissions are needed to remain competitive and meet market access demands.

Stationary energy sector – technological innovations

Within the stationary energy sector there has been a range of developments in renewable energy technologies. As New Zealand's total primary energy supply already comes from mainly renewable energy sources including hydropower, geothermal energy, wind and bioenergy, international developments in the energy sector are not as influential when compared to other countries. Yet market drivers, policy decisions and advancements in renewable energy still impact New Zealand's

[298] Producer Leaders. (2023). *The Role of Consumers In Driving Sustainable Produce Practices.* https://www.produceleaders.com/the-role-of-consumers-in-driving-sustainable-produce-practices/
[299] European Union. (2024). *Ecodesign for Sustainable Products Regulation.* https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en?
[300] Fonterra, media release (2025): Fonterra announces new incentives for farmers to reduce emissions | and Radio New Zealand (2025): Thousands of farmers to earn cash for their climate efforts | RNZ News

stationary energy sector as well as the opportunities available to drive Canterbury's low emissions transition.

Solar panel technology is constantly evolving with advancements to increase solar cell efficiency, the introduction of more abundant and new materials, and advancements in manufacturing techniques[301]. Next-generation solar panels include promising innovations like perovskite solar cells, tandem solar cells and bifacial panels. Perovskite solar cells provide a low-cost option with higher efficiency which can absorb a broad range of wavelengths. Chinese firm LONGi has achieved record-breaking energy efficiency (26.81%) with its tandem solar cell [302]. Bifacial solar panels allow sunlight to be captured from both sides of the module, and the versatility and efficiency of this technology make bifacial panels particularly valuable in commercial installations and large-scale solar farms[303].

Researchers are also working on ultralight fabric solar cells which produce 18 times more power per kilogram. These flexible solar sheets are easy to transport and deploy, with MIT researchers designing them to increase accessibility of sustainable power generation[304]. Smart inverters are also increasing in popularity due to their energy management potential, higher efficiency and enhanced performance[305].

Wind energy currently makes up approximately 6% of New Zealand's electricity, and the country has 21 commercially operating wind farms[306]. There are significant developments internationally in wind technology to increase energy output and improve cost-effectiveness that could influence progress with using wind energy in New Zealand. These include the invention of larger and more powerful turbines, with companies trailing more powerful offshore wind turbines like GE's Haliade-X (capacity up to 14MW) and Vestas 15MW offshore wind turbine[307]. Aerodynamic blade designs are another strategy to improve performance and increase the sustainability of the turbine, with a promising example being Siemens Gamesa's RecyclableBlade design[308].

Transport sector:

Rapid advancements in the transport sector are resulting in a range of promising emissions reduction opportunities globally.

[301] Greenlancer. (2024). *7 New Solar Panel Technology Trends Shaping the Future.* https://www.greenlancer.com/post/solar-panel-technology-trends
[302] ibid
[303] Solar Plus. (2025). *Unlocking the Potential: Understanding the Technology Behind Bifacial Solar Panels.* https://www.greenlancer.com/post/solar-panel-technology-trends
[304] Greenlancer. (2024). *7 New Solar Panel Technology Trends Shaping the Future.* https://www.greenlancer.com/post/solar-panel-technology-trends
[305] Solar Plus. (2025). *Unlocking the Potential: Understanding the Technology Behind Bifacial Solar Panels.* https://www.greenlancer.com/post/solar-panel-technology-trends
[306] Energy Efficiency and Conservation Authority. (2024). *Wind.* https://www.eeca.govt.nz/insights/energy-in-new-zealand/renewable-energy/wind/
[307] GE Vernova. (2024). *Haliade-X offshore wind turbine.* https://www.gevernova.com/wind-power/offshore-wind/haliade-x-offshore-turbine
[308] Simk, R. (2025). *Major Breakthrough In Wind Turbine Blade Recycling: DecomBlades Achieves Full Circularity.* https://moveitmagazine.com/2025/01/16/major-breakthrough-in-wind-turbine-blade-recycling-decomblades-achieves-full-circularity/

TECHNOLOGICAL INNOVATIONS:

EV battery advancements and innovations overseas are reducing costs and making EVs more competitive with internal combustion engine vehicles. Advancements to EV batteries include sand-based batteries, silicon anode batteries, cobalt-free batteries and vertical carbon nanotube electrode batter design[309]. These advancements increase energy storage, battery power, reduce expensive minerals, and improve battery capacity or lifespan. Innovations like solid-state batteries with faster recharging, better safety and higher energy density are progressing, and Chinese automaker SAIC has announced they will begin production of solid-state batteries in 2026[310]. Sodium-ion batteries are another promising innovation offering more sustainable and cost-effective batteries, which would make EVs more accessible[311]. Yet many of these advancements and innovations will need to be further developed to compete with current lithium-ion batteries[312]. Technological breakthroughs and mass production of EV battery innovations can impact New Zealand's low-emissions transition through making EV vehicles more attractive to consumers, driving prices down through greater supply, and providing partnership opportunities in trialling or developing new battery options.

Advancements in low-emissions hydrogen technology are gaining interest with the potential of yellow hydrogen and white/gold hydrogen[313], as well as advancements in green hydrogen production. Countries including Japan, Germany, Australia and the United States are leading efforts to scale up green hydrogen production and there are also a growing number of collaborations between industry and government to increase the efficiency and cost-effectiveness of electrolysers[314]. China is also emphasising both green and blue hydrogen production, with the government outlining hydrogen production capacity targets of 35 million metric tons per year by 2030[315]. Companies including H.W. Richardson, Halcyon and Hiringa Energy are implementing ambitious hydrogen initiatives in New Zealand's heavy transport industry, with Halcyon opening the countries first green hydrogen fast refuelling station in 2024. Developments in green hydrogen are also occurring in the Canterbury region with the New Zealand aviation consortium, which includes Christchurch International Airport, outlining a vision for the aviation transition to hydrogen[316]. Global

[309] Row, A. (2024). *6 EV Battery Innovations That Could Change the Automotive Industry*. https://www.customprocessingservices.com/blog/ev-battery-innovations-automotive-industry

[310] Bobylev, D. (2024). *SAIC's second-gen solid-state battery mass production to start in 2026. CarNewsChina*. https://carnewschina.com/2024/11/25/saics-second-gen-solid-state-battery-mass-production-to-start-in-2026/

[311] Krampf, S. (2024). *What's New in EV Battery Technology for 2024.* Sodium Battery Hub. https://sodiumbatteryhub.com/2024/11/23/whats-new-in-ev-battery-technology-for-2024/

[312] Standford Report. (2025). *Sodium-ion batteries need breakthroughs to compete.* https://news.stanford.edu/stories/2025/01/sodium-ion-batteries-need-breakthroughs-to-compete

[313]Hydrogen colours correspond to the GHG emission profile of the energy source or process used to extract hydrogen. The brighter colours (e.g. green, blue, turquoise and pink) have lower emissions, while the gloomier colours (grey, brown and black) have higher emissions (Green, blue, brown: the colours of hydrogen explained - CSIRO). White hydrogen is naturally occurring, and is generated by continuous geochemical reactions in hard rock (see White hydrogen: 5 of the most critical questions answered | World Economic Forum)

[314] GNS Science. (2024). *2024 Annual NZ Hydrogen Ecosystem Update.* https://www.gns.cri.nz/our-science/energy-futures/green-hydrogen/2024-annual-nz-hydrogen-ecosystem-update/#:~:text=Countries%20like%20Germany%2C%20Japan%2C%20and%20Australia%20are,a%20cornerstone%20of%20the%20future%20energy%20system

[315] ibid

[316] RNZ. (2023). *Airbus, Air NZ and others join forces to launch green hydrogen aviation.* https://www.rnz.co.nz/news/business/497426/airbus-air-nz-and-others-join-forces-to-launch-green-hydrogen-aviation

advancements in hydrogen production are therefore likely to continue to influence the speed of New Zealand's adoption and production of green hydrogen.

There are also a range of technological innovations occurring internationally to reduce GHG emissions from freight and aviation that will influence progress in New Zealand. Sustainable aviation fuels are made of renewable or recycled materials (such as biomass, waste oils or captured CO2) and researchers have estimated that switching to these fuels could contribute approximately 65% of the reduction in emissions required for the aviation industry to reach zero emissions by 2050[317]. The ongoing development of low carbon freight solutions, including electric and hydrogen powered heavy vehicles and biofuels for long haul shipping, are presenting key emissions reduction opportunities globally. For example, DHL Freight and Volvo Trucks are piloting hydrogen powered trucks which are carbon-neutral and are intended to be commercialised before 2035[318]. Hyundai New Zealand recently unveiled their first XCIENT Fuel Cell truck, making New Zealand the third country following Korea and Switzerland to introduce a hydrogen-powered trucks programme[319]. As New Zealand is investing in emerging technologies to reduce freight and aviation emissions, international influences may pose less risk to ensuring these industries remain competitive.

REGULATIONS:

Zero-Emission Vehicle (ZEV) Regulations require vehicle manufacturers to sell a certain percentage of hybrid EVs or zero-emissions vehicles. These regulations have been implemented in many countries to achieve long-term emissions reduction goals. In 2024 the UK implemented a zero-emission vehicle mandate which requires all new cars and vans to have zero emissions by 2035[320]. This is the most ambitious regulatory framework for the switch to EVs globally, and the UK government has invested $2 billion to expand charging infrastructure and incentivise zero emissions vehicles to achieve this target. California adopted a ZEV programme in 1990 and has set an updated target in 2022 aiming for 100% of sales of new light-duty vehicles to be EVs by 2035[321]. New Zealand may come under increasing pressure from climate partners and collaborators overseas to implement a similar ZEV scheme.

Alongside zero emissions regulations, many countries are implementing stricter vehicle efficiency standards to reduce emissions and push for increased adoption of EVs. As referenced earlier, the EU has adopted the Fit for 55 CO2 standards which require CO2 emissions reductions for new cars and vans of 50% (vans) and 55% (cars) by 2030, which increases to 100% by 2035 compared to 2021 levels. In 2024 the European Council also adopted CO2 standards for heavy-duty vehicles (HDV). These standards require a 45% HDV CO2 reduction by 2030, a 65% reduction by 2035, and 90%

[317] IATA. (2024). *Developing Sustainable Aviation Fuel (SAF).* https://www.iata.org/en/programs/sustainability/sustainable-aviation-fuels/
[318] Bergstrand, D. (2024). *7 common questions about hydrogen trucks.* https://www.volvotrucks.com/en-en/news-stories/insights/articles/2024/jun/7-common-questions-about-hydrogen-trucks.html
[319] Hyundai. (2024). *The world's first mass produced Hydrogen powered heavy-duty truck is here!* https://www.hyundai.co.nz/trucks/xcient/fuel-cell
[320] UK Parliament. (2024). *Pathway for zero emission vehicles transition by 2035 becomes law.* https://www.gov.uk/government/news/pathway-for-zero-emission-vehicle-transition-by-2035-becomes-law
[321] Transport Policy. (2024). *California ZEV.* https://www.transportpolicy.net/standard/california-zev/

reduction by 2040[322]. Australia also implemented New Vehicle Efficiency Standards to incentivise car companies to supply new cars with less fuel per kilometre, commencing in 2025[323]. New Zealand has a Clean Car Standard in place to encourage low and zero emissions vehicle imports into the country, through the standards were found to be increasingly difficult for importers to meet so were amended in 2024. Yet, as with zero emissions vehicles, there may be public pressure for New Zealand to later strengthen the standards given commitments from other countries and EV advancements.

EV incentives and subsidies are increasingly implemented by governments globally as a key policy tool to reduce emissions and meet climate targets. Singapore has implemented road tax reductions, grants for EV chargers and rebates on EV registration fees to significantly lower costs, resulting in a surge of EV adoption[324]. The policy was so effective that in the first half of 2024 a third of all new cars sold in Singapore were electric. Norway has also implemented policy ensuring EVs are exempt from import duties, toll road chargers and VAT, aligning with their goal for all new cars sold by 2025 to be zero emissions[325].

Waste Sector:

Reducing emissions from the waste sector may be influenced by policy decisions, technological developments and market-drivers of other sectors. For example, international agreements for methane reduction and a range of other policies will impact waste emissions, and carbon capture technologies will be increasingly implemented at process plants generating energy from waste emissions. The following section will focus on regulations and technological developments directly aimed at reducing greenhouse gas emissions from the waste sector, and how these advancements will impact New Zealand and Canterbury.

TECHNOLOGICAL INNOVATIONS:

The number of anaerobic digestion plants and advanced recycling technology facilities are increasing globally due to sustainability requirements and growing concerns around waste management. Anaerobic digestion of solid and liquid waste involves breaking down organic matter in the absence of oxygen to produce biogas and digestate. Biogas is a natural gas that is commonly used to provide heat, generate electricity, and power cooling systems[326].

Advanced recycling technologies (known also as molecular recycling and chemical recycling) are used for traditionally hard-to-recycle plastics and processing mixed plastics. Global investment in these options is growing and New Zealand companies are already beginning to partner with government and trial these technologies. In 2024, Licella and Oji Fibre Solutions partnered with Silver Fern Farms

[322] Miller et al. (2024). *Status of vehicle standards in Europe and North America – May 2024.* https://theicct.org/wp-content/uploads/2024/06/TTDS24-Policy-Brief-WEB-A4-65008-v5.pdf
[323] Australian Government. (2024). *Australia's New Vehicle Efficiency Standard.* https://www.infrastructure.gov.au/infrastructure-transport-vehicles/vehicles/new-vehicle-efficiency-standard/australias-new-vehicle-efficiency-standard-frequently-asked-questions
[324] JLL. (2023). *How incentives are powering electric vehicle growth.* https://www.jll.nz/en/trends-and-insights/investor/how-incentives-are-powering-electric-vehicle-growth
[325] Norsk. (2024). *Norwegian EV Policy.* https://elbil.no/english/norwegian-ev-policy/
[326] EPA. (2024). *How Does Anaerobic Digestion Work?* https://www.epa.gov/agstar/how-does-anaerobic-digestion-work

and Woolworths New Zealand in a joint feasibility study to determine the benefits of a local advanced recycling industry[327]. This study is also supported by the Ministry for the Environment's Plastics Innovation Fund, and there has been pressure to assess New Zealand's potential for the technology as Australia has a commercial advanced chemical recycling project underway. In addition, Ecogas has developed New Zealand's first organics processing facility using anaerobic digestion, and has proposed a processing facility in Christchurch[328].

REGULATIONS:

Extended producer responsibility (EPR) regulations aim to hold producers accountable for the environmental impact of the entire lifecycle of their products. The regulations require producers to pay for the costs of recycling and disposing for their products, which can reduce the burden on municipal waste management operations. Australia's EPR scheme, for example, is ambitious, and has set National Packaging Targets which require 100% of packaging to be reusable, recyclable or compostable by 2025[329]. As countries adopt more progressive EPR regulations, New Zealand may be influenced to increase the ambition of our own EPR scheme.

Policies to divert waste from landfill are increasingly implemented globally. The European Union has a waste policy which mandates member states to reduce the amount of municipal waste sent to landfill to 10% or less of the total municipal waste generated by 2035[330]. Policies including landfill bans and taxes, and incentives for recycling have been most successful in reducing landfill in the EU. Western Cape Province in South Africa set a target in 2022 to divert 50% of organic waste from landfill and aims to increase this to 100% by 2027[331]. These regulations and targets reflect increasing ambition towards reducing waste and GHG emissions from the waste sector, and as a result there has been growing interest in implementing similar policies in New Zealand.

[327] Joint Press Release (2024): Study Into New Zealand-first For End-of-life Plastic Recycling | Scoop News
[328] Gas NZ (2025): Renewable energy from waste for Christchurch — Gas New Zealand
[329] Source Green. (2024). *EPR Laws for Packaging in Australia and New Zealand: A Comprehensive Guide for Businesses.* https://www.sourcegreen.co/food-packaging/epr-laws-for-packaging-in-australia-and-new-zealand-a-comprehensive-guide-for-businesses/
[330] European Environment Agency. (2024). *Diversion of waste from landfill in Europe.* https://www.eea.europa.eu/en/analysis/indicators/diversion-of-waste-from-landfill
[331] Mackenzie, M. (2024). *International policy overview of organic waste bans to landfill.* https://www.dpmc.govt.nz/sites/default/files/2024-07/PMCSA-24-03-02-V1-OPMCSA-Internship-output-Organic-waste-bans-to-landfills-M-McKenzie-V1-wcs.pdf

6 Transition challenges, opportunities and potential local government interventions

To support a low emissions transition across the emitting sectors, the region needs to adapt to the opportunities presented from developing technologies, renewable energy, and electrification. While central government develops the regulatory and policy frameworks for change, local government can ensure communities, businesses and industries are informed about what is changing, how to adapt, and when to act. Local government needs to explore new investment opportunities to meet the large financial investments needed in the infrastructure and technology that support greenhouse gas emissions reduction, and has a strong role to play in behaviour change (and particularly how to make it easier for people to make those behaviour changes). Existing planning and consents processes need to be informed, flexible, and encouraging of applications that present opportunities for an emission transition. Low-emissions plans and roadmaps should align with New Zealand greenhouse gas emissions budgets, plans and targets.

This chapter considers at a high level the range of challenges (barriers and risks) and opportunities that present themselves as the transition to a low-emissions future is navigated. These opportunities will need further investigation as to their feasibility and impacts. Based on the challenges and opportunities, it also offers a range of options for council interventions to support sectors to transition, and considers the changes that are required at a system level to effect change across all sectors.

Further transition opportunities may be identified as progress with related Partnership Plan projects is made in the 2025-26 year. In addition, opportunities could also be identified through the process to develop an integrated regional plan, and as a result of the Government's resource management and local government reform.

This chapter is structured as follows:

- Agriculture, forestry and other land use sector
- Energy sector
- Transport sector
- Waste sector
- Industrial Processes and Produce Use (IPPU) sector
- Cross-sector and system changes and interventions.

Agriculture, forestry and other land use

As noted in the Background chapter, the agriculture, forestry and land use sector (largely referred to as 'the agriculture sector' in this chapter) forms a large part of Canterbury's emissions profile, accounting for 61% of regional emissions. All Canterbury councils except Christchurch City Council has agricultural emissions as the largest emission source.

The Background chapter also references the national targets for reducing biogenic methane under the Climate Change Response (Zero Carbon) Act which are worth repeating at this stage for context:

- 2030 target of a 10 percent reduction in biogenic methane (from 2017 levels)
- 2050 target of a 24 to 47 percent reduction of biogenic methane (from 2017 levels) and a net zero accounting for all other gases.

BARRIERS TO TRANSITIONING

Major barriers to transitioning the agriculture sector are economic constraints and some current operational practices. Examples are set out below:

Barrier	Description
Market drivers and investment	There are New Zealand and global economic drivers that influence the GDP of agricultural activities and their supply chains. Farming systems are influenced by market trends that affect the annual profits and surplus capitol to introduce low emissions changes[332]. Already New Zealand has seen some farms closing, and the Ministry for Primary Industries expects that there will be continued decline[333] in the future. Emissions management can be seen as a barrier to economic prosperity due to the burden of regulations and investments. This carries influence on the commitments made by those in the sector to act. Failure to meet the economic sensitivities of the industry all the while balancing the needs to mitigate climate change through emissions reductions could restrict the transition strategy's commitment to an equitable transition.

[332] Ministry for Primary Industries (2019). Climate issues facing farmers: https://www.mpi.govt.nz/dmsdocument/33747-climate-issues-facing-farmers-sustainable-land-management-and-climate-change-research-programme

[333] Ministry for Primary Industries (2024). Situation and Outlook for Primary Industries: Situation and Outlook for Primary Industries June 2024

Cost and availability of technologies/solutions	GHG reduction technologies come with some significant capital and operational investment. Kellogg's Rural Leadership Programme[334] conducted research on reducing New Zealand's livestock methane emissions, which included research on the costs to implement technology on farms. The evidence suggested that there will be costs to change farm practices, which may include scaling up of technologies, consultancy fees, construction, storage or maintenance of assets, and more. Further, some technologies are still some time away from being available to use on-farm, making it challenging to predict the cost of investments.
Livestock density	Canterbury has one of the highest densities of livestock per hectare in NZ[335]. Beef cattle and dairy cattle are the second largest in New Zealand while sheep numbers have reduced dramatically since 1990. Sheep emit, on average, 13kg of methane every year, compared to 61kg for dairy cattle and 98kg for beef cattle. Even deer emit 25kg per year, which is also a growing livestock industry[336]. The favour for more emissions-intense livestock in the last few decades has resulted in a rise in emissions and is a barrier to change.
Grazing and feed practices	It is common in NZ to have extensive grazing areas where livestock can graze freely on natural vegetation. These practices can make it difficult to control emissions. The Canterbury plains are prone to climate-related flooding and drought events - during extreme events and in some agricultural practices, grass is substituted for feed. Such practices can limit access to a diversity of grass or increase reliance on feed, which commonly contains grains. These practices can cause higher rumen emissions[337].

[334] Kellogg Rural Leadership Programme (2023). Reducing New Zealand's Livestock Methane Emissions: William-Aitkenhead_Reducing-methane-emissions.pdf
[335] Statistics NZ (2024). Livestock numbers: Livestock numbers: Data to 2023 | Stats NZ
[336] AgMatters: Reduce methane emissions | Ag Matters
[337] New Zealand Agricultural Greenhouse Gas Research Centre (2019): NZAGRC Factsheet Low Greenhouse Gas Feeds | New Zealand Agricultural Greenhouse Gas Research Centre

RISKS TO TRANSITIONING

There are a range of significant risks involved in transitioning the sector, which could impact the speed and success of the transition. These largely relate to policy settings, economic uncertainty, and access to technology, and include:

Risk	Description
Future planning	Work to progress the Agritech Industry Transformation Plan and other AFOLU Transformation Plans, which sought to establish a collaborative approach to developing the agriculture sector, ceased in 2024 as a result of a change in government policy. It included efforts to drive land use improvement and education, training and advisory services, particularly making the sector more inclusive for iwi/Māori[338]. Without these plans, there is a risk that an inclusive and diverse labour market will not be developed for the industry. Relatedly, the Climate Change Commission 2024 Emissions Reduction Monitoring Report[339] notes that future funding for land use changes is uncertain, which creates another level of unpredictability.
Economic uncertainty	Future economic uncertainty will always pose a threat to any country's Gross Domestic Product. Given that meat and dairy is the region's highest exporting sectors[340], the region must sensitively approach emissions reductions efforts. It should balance policies that decrease emissions while ensuring it does not decrease productivity. Stability in the import and export markets will have a direct impact on the productivity and spare capital of farmers. Without economic stability and residual funds, it will be difficult for the sector to invest in low emissions abatement opportunities, inadvertently increasing the risk to a low emissions future. Adaptive measures are needed to manage market uncertainties while maximising opportunities and benefits. Many countries are investing in their own low emissions agriculture transitions and market competition could devalue New Zealand's position if it does not keep up. Global trends[341] relating to customer perspectives on sustainable food practices will also influence the risk profile of New Zealand's meat and dairy sector.
Agriculture emissions pricing	A key national-level policy intervention to support meeting New Zealand's emissions budgets is the introduction of agricultural emissions pricing[342].

[338] MBIE website: Agritech | Ministry of Business, Innovation & Employment
[339] Climate Change Commission (2024). Monitoring Report: Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf
[340] Environment Canterbury: Economy, jobs and trends | Environment Canterbury
[341] See the chapter on international influences for more information.
[342] Climate Change Commission (2024). Monitoring Report: Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf

	At the time of writing, there is little information about the requirements of the new scheme planned for 2030, which creates uncertainty about the future economic impacts of farming. Likewise, effective information on emissions reduction pathways for agriculture remain unclear. To test the impacts of agriculture emissions pricing, a report by the Reserve Bank of New Zealand modelled the hypothetic impacts of anticipated agricultural emissions pricing ($/tonne CO_2e). Results concluded that while base level prices saw a marginal increase in the proportion of dairy and sheep and beef exposures that are unprofitable, an increase in emissions pricing could significantly increase the exposure[343].
Access and costs of new technologies	To enable widespread use of new emissions reduction technologies, adequate funding for research and development is needed[344], and farmers need to be able to afford to access it. Unlike other sectors, the incentive for emissions reduction is not provided through the emissions trading scheme. A lack of incentive to reduce emissions, as well as not being able financially to access to technologies and solutions to reduce emissions, are a barrier and risk. Further, many of the technologies outlined in the current Emissions Reduction Plan to reduce agricultural emissions have minimum deployment dates extending beyond 2030, which risks the power for immediate action. Farmers are waiting for the development of these technologies, which upon release, may include high capital costs with limited real-world testing. Waiting until 2030 and beyond reduces the urgency for action and delays the potential for emissions reduction. The AgriBusiness group conducted a report on agricultural greenhouse gas mitigation technologies and concluded that barriers and risks to uptake are considerable. These support the delays in commercial availability, citing issues such as: unproven technologies, incompatibility with NZ farming systems, and regulatory barriers for use – in particular, plant-based alternatives in feed[345].
Impacts of new technologies	Some of the technologies and solutions may have conflicting impacts. For example, feeding forage rape might reduce methane emissions but their benefit might also cause a nitrous oxide emissions increase. Similarly, using low nitrogen feeds will be of little benefit if methane emissions increase[346]. There is a balance to be made when taking up new technologies. These stretch beyond the additional emissions impacts but may have broader environmental impacts, or even negative impacts on society and the economy.

[343] Reserve Bank of New Zealand (2023). 2022 Climate Change Risk Assessment for Agricultural Lending: RBNZ 2022 climate change risk assessment for agricultural lending
[344] Climate Change Commission (2024). Monitoring Report: Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf
[345] Agribusiness Group (2023). Report on agricultural greenhouse gas mitigation technologies: Report-on-agricultural-mitigation-technologies-Final.pdf
[346] New Zealand Agricultural Greenhouse Gas Research Centre (2019). Low greenhouse gas feeds: NZAGRC Factsheet Low Greenhouse Gas Feeds | New Zealand Agricultural Greenhouse Gas Research Centre

Reliance on or moves towards land use for carbon forestry	Research by the Hurunui District Council[347] notes there has been an increase in farms converting their land use to tree planting and offsetting. While the change is carbon positive, it poses risks for rural communities and their economy. Without greater understanding of the pathways to meeting emissions reduction targets that balance the stability of society, the environment and the economy for each district, there is a risk that more farms will see carbon forestry as the way forward, despite recent government moves to limit this[348].

OPPORTUNITIES FOR TRANSITIONING

The greatest sector opportunities stem from the technological, economic and operational changes facing the sector.

Despite risks around new technologies, there are a range of available technologies already on the market, as well as good information about costs and how they may be used on farm[349]. While some technologies still require research and development, other technologies are available now and in use by some farming operations. This includes:

Tool/technology	Description
Low-emissions livestock	As referenced in the chapter on key actors and emissions reduction initiatives, technology to breed low-emissions sheep is available and being used already on-farm. This is being trialled on cattle, and has already shown a 10 percent reduction in methane through improved genetics, and in the lowest-emitting bulls around 15-20% less methane than the average [350].
Livestock feeds	Scientists have shown that some supplementary feeds ferment differently in the rumen and reduce methane per unit of feed intake, while others have a lower nitrogen concentration meaning less nitrogen is excreted onto pastures[351]. The Ministry for Primary Industries estimates that the adoption of feeds could reduce methane emission by around 20-30 percent[352]. This solution may require local authorities to map out agricultural systems to help steer a balanced network of cattle farmers and farms that can grow crops that support the feedstock.

[347] Hurunui District Council (2023). Available from: Environmental Scan 2023
[348] Ministers of Forestry and Climate Change (2024): Protecting NZ food production and ETS credibility | Beehive.govt.nz
[349] See, for example, a 2020 OECD survey: A survey of GHG mitigation policies for the agriculture, forestry and other land use sector | OECD; Kellogg Rural Leadership Programme (2023): William-Aitkenhead_Reducing-methane-emissions.pdf; and research available from the New Zealand Agricultural Greenhouse Gas Research Centre.
[350] LIC (2025). Reducing methane emissions in dairy animals: Reducing methane emissions in dairy animals | LIC
[351] Kellogg Rural Leadership Programme (2023). Reducing New Zealand's Livestock Methane Emissions: William-Aitkenhead_Reducing-methane-emissions.pdf
[352] Ministry for Primary Industries (2024). Information sheet: Hot topic – Methane production by ruminant animals: current and future technologies: INFORMATION SHEET: Hot topic – Methane production by ruminant animals: current and future technologies - April 2024 - Office of the Prime Minister's Chief Science Advisor

Manure management	A possible solution for rural communities could be a combined management of organic food waste, residual crop and waste crop materials, manure and wastewater sewage. There are existing technologies available that can manage these waste products' energy recovery. Currently the New Zealand Agricultural Greenhouse Gas Research Centre does not support any projects in this area, so there is the potential to source funding to support a project in the region[353]. These facilities could be a community scale infrastructure investment that provides: • management of organic waste materials from several sectors • capture of methane gases from existing 'non-mitigated' practices • recovery of electricity through burning of on-site biogas from digestion processes, or generation of heat for supply to local receptors (schools, farms, leisure centres etc.) • creation of a nutrient-rich digestate for land, with added reduction of fertilisers (currently 5 percent of land use emissions).
Precision agriculture	Precision farming provides many opportunities to improve efficiency and minimise environmental impact through the use of available technology – such as soil sensors to monitor moisture levels (which helps to reduce irrigation and fertiliser use), drone technology to monitor pasture conditions, and precision feeding techniques to tailor stock diets more effectively[354]. Increased take-up of this technology will support on-farm emissions reductions, and local government can work with the industry and research organisations to promote latest innovations.

METHANE INHIBITORS AND VACCINES

While not available yet in New Zealand, inhibitors and vaccines will be a significant tool in decreasing the harmful effects on the environment from livestock. There are strict rules on their use, but some experiments have shown 30-50% emissions saving are possible in sheep[355]. Methane inhibitors aren't expected for release until 2032 in New Zealand[356]. Methane vaccine research has been undertaken for many years by AgResearch, and in 2024 the Government

[353] New Zealand Agricultural Greenhouse Gas Research Centre, Manure Management. Available from: Manure management | New Zealand Agricultural Greenhouse Gas Research Centre

[354] See, for example, Zero Carbon Innovations: Reducing NZ's Agricultural Emissions - Zero Carbon Act , Farm viability improved through precision agriculture | Environment Canterbury and FAR Research | Stocktake of precision agriculture in New Zealand.

[355] AgResearch (2017) Reducing new Zealand's agricultural greenhouse gases: 1501479614891.pdf

[356] Ministry for Primary Industries (2024). Information sheet: Hot topic – Methane production by ruminant animals: current and future technologies: INFORMATION SHEET: Hot topic – Methane production by ruminant animals: current and future technologies - April 2024 - Office of the Prime Minister's Chief Science Advisor

announced a new methane vaccine venture would be established by AgriZero NZ to focus on speeding up vaccine development[357]. Local governments in the region could help support or partner with industry to drive innovation in inhibitor research and practice.

A key opportunity for local government to support uptake of already-available technology could be through developing and promoting advice and guidance on technology availability, or raising awareness of the range of grants, subsidies, and other funds that could be available to support change.

There are also a range of opportunities relating to industry operating practices. These include:

Operating practice	Description
Emissions testing and data management	Consistency in data collection practices helps farmers and local governments to develop baseline emissions. From developing baselines, a consistent template for farm emissions management plans can also help to evaluate the best practicable options to reduce emissions at a farm level. An example to improve data that can be used now is AgResearch's mobile Portable Accumulation Chamber, which can be transported between farms to efficiently test the methane emitted from cattle. Data from technologies such as this can help farmers to understand the climate change impacts of their operations and to help better develop mitigations, which may include changes in feed, or breeding lower emitting cattle[358]. Other similar technologies are outlined through the New Zealand Agricultural Greenhouse Gas Research Centre[359]. Improving emissions data collection at source allows for baselines and benchmarks to be developed, which can assist in determining reduction pathways and the development of roadmaps to achieve targets.
Sustainability accreditation	Global demand for low-emissions meat and dairy products has increased over the years and many markets are seeing producers respond to this through the development of meat and dairy alternatives. New Zealand agriculture's gross domestic productivity will be impacted by this as a large exporter of meat and dairy products. New Zealand markets are perceived as green and farm to table, however, there are stark contrasts between farming systems, from large scale industrial farming practices to small organic and nature-based systems. Commonly, exports and domestic sales are pressured by the agriculture and food processers, and distributors and retailers, who are being asked to for more transparency in their practices from consumers. By leveraging sustainability credentials and certifications, such as that from Silver Fern Farms[360] or the

[357] AgResearch (2024): New venture for methane vaccine development - AgResearch
[358] AgResearch (2023). New tech to boost emissions reduction efforts: New tech to boost emissions reduction efforts – AgResearch
[359] NZAGRC.org. The Science of Methane: The science of methane | New Zealand Agricultural Greenhouse Gas Research Centre
[360] Silver Fern Farms, Net Carbon Zero by Nature. Available from: Farm Level - Net Carbon Zero by Nature Science | Silver Fern Farms

	Lead With Pride programme offered by Synlait[361], farmers could demonstrate an emissions baseline and management plan as well as targets to improve other environmental impacts and increase labour and supply chains.
Offsetting	Offsetting should always be a last resort, with emissions reduction and prevention the focus. Nevertheless, the land use practices of remote and rural locations offer the opportunity to provide beneficial carbon sequestration opportunities. The environmental benefits from planting in rural locations are broad but include • improved soil stability • pollution capture and improved water quality • climate resilience (particularly flooding) • biodiversity and habitat enhancement. Given the Government's focus in the current emissions reduction plan on carbon sequestration, there are opportunities to leverage national-level policies and initiatives across the region. For example, the Government is currently considering interest in partnerships to plant trees on Crown-owned land with low farming and conservation value (excluding National Parks)[362]. Restoring indigenous biodiversity and wetlands in the region are also another opportunity. There are also opportunities for local government to work more closely with Māori communities to learn about nature-based kaitiakitanga through local knowledge, and to restore or create native plants, wetlands and forests to increase the indigenous biodiversity of the region.
Advisory services	To help manage some of the risks outlined above, there is an opportunity to increase the use of farm advisory services[363]. These services cover a broad spectrum, including ones that both regional and district councils provide to improve both productivity and emissions reductions across sector groups. Alternatively, or as well as, local governments could promote greater use of farm advisors in the region.

[361] Synlait website: Lead-With-Pride.pdf
[362] Minister of Forestry (2024): Government seeks partnerships to plant trees on Crown-owned-land | Beehive.govt.nz
[363] Climate Change Commission (2024). Monitoring Report: Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf

COUNCIL INTERVENTION OPPORTUNITIES

As described above, some key areas for council intervention to support the reduction of agricultural emissions are:

- increase support given to farmers through improved advisory services, or encouraging greater use of farm advisors
- review Good Management Practices guidelines alongside industry and Crown Research Institutes/Public Research Organisations to include management of greenhouse gas emissions
- support uptake of already-available technology through developing and promoting advice and guidance on technology availability, or raising awareness of the range of grants, subsidies, and other funds that could be available to farming operators to support change
- consider how councils can partner with the Government on its carbon sequestration aspirations in the Emissions Reduction Plan, and improve indigenous biodiversity through partnerships with mana whenua
- promote available tools to improve emissions data collection and reduction at source
- improve understanding and awareness of methane-reducing livestock feeds through supporting or facilitating the sector to map out agricultural systems to help steer a balanced network of cattle farmers and farms that can grow crops that support the feedstock
- support or partner with industry to drive innovation in methane inhibitor research and practice
- promote available tools to improve emissions data collection at source
- support the sector to prepare for 2030 emissions pricing.

The Second Emissions Reduction Plan includes actions that tie to the scope of influence of regional, city and district councils:

Getting tools to farmers and growers faster, by investing in research, development and commercialisation	Ensuring there are effective regulatory frameworks for new tools – here and internationally	Better estimating on-farm emissions consistently across the country	Supporting changes in practice on-farm	Reviewing the methane science and target	Bringing in an on-farm emissions-pricing system by 2030

To bring all of these opportunities together and align with the government direction in the Emissions Reduction Plan, the region's local governments could lead, support or facilitate some of the below initiatives alongside industry and research organisations to support the sector in the lead-up to, and implementation of, emissions pricing:

Concept/initiative	Description
Circular economy	support a circular economy approach in the region, which might include linking organic waste recovery to produce fertiliser for use as alternative to existing high emissions fertilisers (see the waste section later in this chapter)
Research & development opportunities	develop and promote an up-to-date list of research grants and funding opportunities nationally and internationally for groups to engage with.
Digital guidance	investigate gaps in council websites on agricultural issues, support and advice and consider whether information could be better structured with connections and wayfinding to sources of information and advice for the sector
Education support	work with tertiary education providers in the region to create opportunities to enable better entry into agriculture, forestry and land use careers (such as apprenticeships, interns, job share, job swaps) and understand what core skills are needed within the sector, and how can they be developed internally or attracted by international experience
Labour market improvements	consider what policies, packages and benefits regionally and locally can be developed to attract and increase the skills needed for a low-emissions transition, including working with central government to attract skilled labour.
Standardising the estimation of on-farm emissions	develop a platform for reporting uptake of technologies and low emissions infrastructure where there is currently a gap. work with the sector to develop standardised templates for the collection of farm emission assessments and management plans to help develop consistency and benchmarks to measure performance.
Climate-related disclosures	work with manufacturers relevant to the sector to measure and disclose climate and sustainability reporting to provide an understanding of the efforts taken to reduce operational and supply chain emissions
Sustainability certification	investigate how existing frameworks for sustainable practices can provide confidence for consumers that they are consuming sustainable produce.
Planning and consents	encourage ongoing professional development of planning and consents staff and consents processes that are streamlined for both staff and applicants. Work collaboratively with other councils to ensure learning is shared, particularly on implementing the current National Environmental Standard for greenhouse gases in industrial process heat (NES-GHG-IPH), and preparing for consenting changes to come as a result of resource management legislation reform
Financial support	work alongside the private sector on funding and financing options for industry (see Overview chapter on climate mitigation funding and financing).
Mātauranga Māori	Mātauranga Māori can be a powerful resource for managing land use and should be the cornerstone in the developing solutions impacting the sector. Greater collaboration with iwi/Māori would develop improved environmental stewardship and socio-economic benefits to their communities.

Some initiatives in the above can be led by local government and implemented now, including digital guidance and planning and consents.

Canterbury councils also have a large lever to support emissions reductions through regional and district planning. The review of the Canterbury RPS presents a key opportunity to ensure support for the transition to a low-emissions future. The current draft RPS, on which further work is paused until 2026, reflects the importance of using regional and local planning instruments to reduce GHG emissions[364]. The direction set by the RPS flows through to the district and city level, supporting emissions reductions in the community through district plans.

Energy

The Background chapter notes that stationary energy accounted for 17% of Canterbury emissions in 2021. Emissions are split evenly for emissions generation from public electricity and heat, and manufacturing and construction sources. Carbon dioxide is the prominent GHG for stationary energy.

The highest emitting geographical area is that of Christchurch City (872ktCO2e) which has double that of the Timaru District (438ktCO2e) and Selwyn District (421ktCO2e). Biogenic carbon emissions regionally are reported as 7.3 percent of stationary energy emissions but is reported separately to all other emissions. Biogenic carbon emissions come from the combustion of organic materials/natural resources (wood), which will include the combustion of biomass for energy.

[364] Environment Canterbury website: Canterbury Regional Policy Statement | Environment Canterbury

BARRIERS TO TRANSITIONING

Major barriers to transitioning away from fossil fuels in the stationary energy sector relate to adequate investment and access to renewable energy, and the nature and accessibility of current fuels, as outlined below:

Barrier	Description
Investment	New Zealand's electricity generation system relies on renewable energy sources, comprising mostly hydroelectric power generation (59.8% of total demand) as well as geothermal (18.5%) and wind (6.5%)[365]. Electricity generation is also supported by the combustion of coal, oil and gas, predominantly in the manufacturing industry through process heat demand. With a high proportion of renewables already in place, funding further infrastructure in new locations will be costly. It is estimated that at least NZD$22 billion of investment in the distribution network is needed across New Zealand this decade[366]. Examples of existing investments in Canterbury is the Lauriston Solar Farm in the Ashburton district, which is an estimated $104 million investment[367], and the Kōwhai Park solar array, construction costs for which are expected to be around $273 million[368]. A solar farm[369] and wind farm[370] are both proposed for North Canterbury. A joint venture between Taiwan and New Zealand for a large-scale green energy facility in mid-Canterbury, agreed in 2024, would carry an initial investment of NZ$3.2 billion[371]. Access to funding or financing for distributed energy generation (such as rooftop solar) is also a barrier. A report from Rewiring Aotearoa found that the key barrier to unlocking renewable energy for homes and businesses was the initial upfront cost[372].
Access to renewables	The availability of renewable energy is not equally accessible across society[373]. It is typically available for more financially stable households and businesses, while those in society who need lower-cost energy seldom have the options to invest in and access

[365] Ministry for the Environment (2024). GHG Inventory 2024: https://environment.govt.nz/assets/publications/GhG-Inventory/GHG-inventory-2024/GHG-Inventory-2024-Vol-1.pdf

[366] Minter, Ellison, Rudd & Watts, Investing in New Zealand's renewable energy sector, 2024. Available from: Investing in New Zealand's renewable energy sector
[367] Genesis Energy: Lauriston Solar Farm | Genesis NZ
[368] Contact Energy (2024): Contact invests in Kowhai Park Solar Farm (1).pdf
[369] Meridian Energy (2024): Swannanoa Solar Farm | Meridian Energy
[370] Mt Cass Wind Farm website: Mt Cass Windfarm
[371] Farmers Weekly (2024): Billions earmarked for Canterbury green energy build
[372] Rewiring Aotearoa (2024): Electric Homes Report: Electric Homes Report | Rewiring Aotearoa
[373] Climate Change Commission (2024). Monitoring Report: Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf

	renewables technology (such as solar panels). It is also not always available – solar works only during daylight hours, wind is intermittent, and hydroelectricity can vary across seasons and years. Further, rural and remote communities also have less access to reliable and affordable electricity services and often need to rely on more fossil fuels for power and heating. Use of older technology and equipment may also lead to disproportionate pollution and emissions compared to new equipment. The cost to develop an emissions reduction plan, which is needed if applying for a consent under the NES for greenhouse gas emissions for industrial process heat, is also a barrier for many businesses.
Availability of fuels	Wood is a common source of heating in Canterbury region, especially within rural and remote communities. Consents and planning for wood burning across the region is relatively consistent and use of wood for burning is permitted, with nuances if a home is outside Clean Air Zones. Compliance with planning may be challenging, particularly in the lead up to 2027 compliance timeline for boiler upgrades and clean air zones[374]. LPG gas is available and popular in the South Island for energy, cooking, and heating, particularly in remote communities where there is limited access to the electricity network. Dominant use is natural LPG as NZ does not produce any useful quantity of bioLPG to help lower GHG emissions[375]. The reliance for some on LPG causes barriers in transitioning to alternative systems. Commonly, other technologies are not compatible with home or commercial heating and energy systems, so costs would need to include complete system changes. The largest fossil fuel used is coal, with the highest consumers being dairy and product manufacturing[376]. Despite the implementation of the NES for greenhouse gas emissions from industrial process heat driving the phase out of coal for industrial process heat, there will be a lag in adoption of practicable lower emissions options, if some of the technology is not readily available in New Zealand to coincide with time phased upgrades of boilers. As referenced in the emissions reduction initiatives chapter, many large process heat users are making progress in transitioning, but there is still a way to go, as evidenced in the Regional Energy Transition Accelerator (RETA) reports produced by EECA.

[374] Environment Canterbury: Home heating | Environment Canterbury
[375] RockGas: The future of bioLPG – Rockgas
[376] Energy Efficiency and Conservation Authority (2024). Regional heat demand database: Regional Heat Demand Database | EECA

RISKS TO TRANSITIONING

There are a range of risks in the transition of the stationary energy sector. These can be broadly categorised as energy security, legislative and regulatory settings, investment in skills, and cost of renewables for industry and households. These risks are discussed below.

Risk	Description
Energy security	New Zealand is continuing to face energy security challenges across the country, with energy demand often greater than energy produced[377]. In Canterbury, anticipated population growth of 0.8% each year up to 2048[378] will create additional stress on energy demand. With population growth, improvements in transport infrastructure, grid decarbonisation and growth in manufacturing, the demand distribution will change, requiring improvements to the energy transmission network. The Ministry of Business, Innovation and Employment estimates that an 80 percent increase in in electricity generation is needed in New Zealand by 2050 to account for growth and the increase in demand to electrify transport[379]. Climate change will compound our reliance on hydroelectricity further as its impacts are anticipated to switch the flows of water over the season between now and 2050 – for example, two Waitaki catchments modelled are predicted to get higher inflows in winter (+26%), and lower inflows in summer (-10%), with a 6% increase in annual flows[380]. In addition, dry periods will increase electricity demand for irrigation. While seasonally it can be positive to have more power in winter when the demand for heating is high, New Zealand maintains a reasonably steady demand for energy year-round, so for Canterbury the energy security risk remains high if there is insufficient diversity in the electricity network[381]. Peak electricity demand during early mornings and nights in winter is also a challenge for the energy transition[382] as solar is ineffective at these times, meaning gas and coal are used to back up the energy system. Use of GHGs increases when gas and coal

[377] Ministry for the Environment (2024). Second Emissions Reduction Plan: New-Zealands-second-emissions-reduction-plan-202630.pdf and RNZ story: Electricity supply crisis: What you need to know | RNZ News

[378] Environment Canterbury: Canterbury's population | Environment Canterbury

[379] Ministry of Business, Innovation and Employment (2024): Electricity Demand and Generation Scenarios: Results summary July 2024

[380] Ministry of Business, Innovation and Employment (2020). Climate change impacts on New Zealand hydro catchment inflows & wind speeds: https://www.mbie.govt.nz/dmsdocument/28350-climate-change-impacts-on-new-zealand-hydro-catchment-inflows-and-wind-speeds-february-2022

[381] Energy Authority, The changing nature of electricity demand in Aotearoa, 2023. Available from: The changing nature of electricity demand in Aotearoa | Electricity Authority

[382] Ministry of Business, Innovation and Employment (2024): Electricity Demand and Generation Scenarios: Results summary July 2024

	are used to support the load. Any new form of energy or energy storage needs to be able to meet the demand peaks and reduce reliance on gas and coal as back-up for energy security.
Legislative and regulatory settings	At the time of writing, there are few economic incentives to encourage emissions reductions in existing or new buildings, and the New Zealand Building Code does not require buildings to be net-zero carbon. Even if the demand were there, the industry is understood to have significant gaps in the skills and knowledge required to deliver net-zero carbon buildings[383]. Relatedly, the proposed amendments to the Energy Efficiency (Energy Using Products) Regulations 2002 have been delayed, which are intended to support consumer decision-making on energy efficiency. From a legislative perspective, this is a time of policy and regulatory change - in December 2024, the government introduced legislation to enable firms to construct offshore wind generation, and is currently reviewing the electricity market. In February 2025, the government also announced an easing of restrictions on electricity lines companies investing in generation to help strengthen the energy network[384]. Further, there is an acceptance within the regulatory framework that fossil fuel or higher-emission source fuel use remains generally accepted. For instance, the use of fossil gas is still acceptable under the Healthy Homes Standards. In addition, the New Zealand Crown Minerals Amendments Bill reinstates petroleum exploration[385], which poses a risk to the speed of the low-emissions transition by undermining current efforts to invest in cleaner technologies. Greater certainty for the energy sector is needed to provide confidence in large and long-term investments.
Skills	Alongside investing in new technologies is the development of relevant skills in the region to adequately support and adapt to a low-emissions future. While Canterbury University offers postgraduate study in renewable energy engineering[386], increased investment in the skills needed for emerging or changing industries like renewable energy is needed at a time when there is already a global race for people skilled in renewables and energy decarbonisation[387].
Costs	The Climate Change Commission estimates $34 billion of additional investments is required by 2035 to finance the energy transition through increased renewable energy generation, energy storage and green infrastructure.

[383] BRANZ (2024): Reducing greenhouse gas emissions in the construction industry | BRANZ and Climate Change Commission (2024): Monitoring report: Emissions reduction (July 2024) » Climate Change Commission
[384] Minister and Associate Minister for Energy (2025): Rules to be eased to drive investment in electricity | Beehive.govt.nz
[385] New Zealand Parliament (2025): Crown Minerals Amendment Bill
[386] University of Canterbury website: Renewable Energy Engineering - postgraduate | University of Canterbury
[387] See for example: Skills bottleneck threatens NZ shift to renewables - The University of Auckland

	The NZ Investor Group on Climate Change notes that there is a significant opportunity for increasing investment, but for most it is a risk – 31 percent of surveyed organisations cite appropriate risk return objectives as barriers to climate investment[388]. While this is generally observed for larger-scale renewables projects and other asset investments, the sentiment could be shared with personal renewables investments from homeowners and businesses. Raising the capital, particularly during periods of economic hardship, is often just not possible. Most renewables require power supply and services changes to ensure assets are compatible (for example, changing coal to electricity requires complete changes to boilers and maybe even to supporting services). The business case for grid electrification needs to be financially achievable, and if it does not stack up for households and businesses, then there is a risk that many may not transition at all, particularly if there isn't sufficient regulatory pressure to drive a low emissions future.

[388] Investor group on Climate Change (2024). The State of New Zealand's Climate Investment 2024: The State of New Zealand's Climate Investment 2024 - Investor Group on Climate Change

OPPORTUNITIES FOR TRANSITIONING

Key opportunities in the transition are focused on policy settings and taking advantage of new technology. These are described below:

Opportunity	Description
Regional approach to energy	Each council provides information and advice on energy, but there is no overarching approach in the region that can be used to target both homeowners and business to reduce their footprint and improve the efficiency of the heating and electricity use. The region's local government has an opportunity to work together to better connect its communities and businesses throughout the region with tools, services and supports they need to transition away from fossil fuels, thereby making the energy transition as easy as possible for residents and businesses. The outcomes of the Mayoral Forum's energy inventory project provide an opportunity to progress a regional, joined-up approach to energy matters.
Improving energy efficiency for homes and buildings	Opportunities to improve energy efficiency will be different depending on whether the home or building is new or existing. Councils can promote alignment with voluntary energy efficiency certification systems for buildings through their advisory, planning and consenting processes. This could be in partnership with an industry organisation such as the New Zealand Green Business Council. In Europe, energy performance ratings provide consumers with choices for home and commercial buildings which results in greater transparency and adoptions of energy efficiency in buildings[389]. Councils could also encourage warmer, dryer homes through widening current eligibility criteria for assistance with replacing older burners or higher-emitting heating with low-emission heating sources and installing insulation. Councils in subregions could work together, or there could be a whole of region approach alongside EECA, for example. There are also opportunities to promote distributed energy generation, most obviously through support for an uptake in solar panels for household and commercial buildings. Councils can also promote the use of digital tools and smart monitoring to increase energy efficiency in buildings.
Biomass and alternatives	There is also an opportunity to work with the industry on understanding and improving the availability of biomass and alternatives (such as biogas or electric boilers). As noted in the RETA reports, Canterbury's industries are still heavily dependent on coal. Transitioning from coal would be economically viable and achievable through fuel-switching to roughly 60% electricity and 40% biomass.

[389] European Union energy performance certificates: EU Buildings Factsheets - European Commission

	Considerable investment is needed in energy transmission infrastructure, while biomass will require the import of resources to meet demand. This does pose a burden on New Zealand's biomass stocks nationally and consideration should be given to balance the need for planting to offset emissions with the removal of trees for burning. Biomass boiler technology is improving, and these are beginning to be used in the region, including in Christchurch's Burwood Hospital[390], and as previously referenced, the McCain Foods site in Timaru, Synlait and Canterbury University. Process heat users need to be able to fully understand the costs and implications when making fuel switching decisions. Impacts on air quality will also need to be understood as part of fuel switching decisions.
Implementation of NES-GHG-IPH	To support the implementation of this NES at the consenting level, there are opportunities to work with industry and EECA to ensure there is sufficient guidance and support available for consent applicants. There is also an opportunity to work with other councils to ensure there is an agreed approach to determining who meets the criteria for a Suitably Qualified Person to review an applicant's emissions reduction plan, which would ensure consistency for businesses with sites across the South Island or country. The cost of applying for this consent is also a barrier for some, as it not only includes the cost of processing the consent, but also the cost of developing an emissions reduction plan. There is therefore an opportunity for councils to consider how they may support smaller businesses to access funding or financing to develop emissions reduction plans – this could be through a new or established council fund, or support/guidance on accessing available funding through organisations like EECA.

Support for innovation	To reach energy decarbonisation targets there will need to be innovations introduced that modernise infrastructure to meet future energy demand across all sectors. These will require both large and small-scale technologies to fit the needs of end users. Local governments will need to support the transition through investment, approvals processes and guidance for solutions. Examples of small- and large-scale innovations are set out below.
	
	• Small-scale technologies: When considering the power needs of end users, there are numerous technologies available to homeowners, businesses and industries, including but not limited to:
	  ○ homeowners – technologies that provide heat and air conditioning such as heat pumps are a viable option to manage home climate requirements and energy efficient solutions. Generation will need to support any scalable transition
	  ○ construction sites – off-grid cabins and site compound electricity can be generated by solar containers[391]

[390] Stuff.co.nz (2023). New biomass boilers help slash Canterbury's reliance on coal for hospitals: New biomass boilers help slash Canterbury's reliance on coal for hospitals | Stuff

[391] See for example: Solartainer Versatile Solar Hybrid Generator | Think Hire, UK

	○ manufacturing facilities – aligning with the RETA programme is needed to decarbonise fossil fuel use with technologies including biomass burners. ○ industrial estate and/or housing developments – within larger development sites, energy and heat networks could provide shared low-cost viable solutions, provided there is a renewables source locally, such as geothermal or waste from energy ○ transport hubs – An increase in EV charging capacity is needed. Initiatives like Three Parks in Wānaka[392] demonstrate an innovative example. • Large scale energy supply: the region has the landscape and climate to accommodate many different types of renewable energies at scale, some of which is used to its advantage already (including hydro stations like Waitaki valley and Mackenzie Basin, Aviemore, Benmore and Ōhau). There are opportunities, perhaps through regional deals, to work alongside central government and industry to invest in energy generation technologies like geothermal, solar, wind, hydrogen and biomass. For example, geothermal energy currently provides around 18 percent of New Zealand's electricity but has the capacity to produce 1,000MW more power[393]. As noted earlier, Canterbury has strong capacity and potential for further large-scale solar farms, and has the capacity to support the generation of hydrogen from the methane gases produced by the agriculture and waste industry in the region.
Advocacy	Local government has a strong role to play in advocating for strong policy and regulatory settings, as well as new initiatives, that would support the energy transition. This could include advocacy for: • a national energy strategy or action plan – this could be informed by the work completed on the Canterbury energy inventory • expansion of the Warmer Kiwi Homes scheme or similar, to include energy efficiency improvements such as ventilation, double glazing, insulation, replacement of gas appliances • the price of carbon (rising based on market demand rather than government caps) • prohibiting new LGP gas appliances in new homes and the sale of incandescent lightbulbs • continued support for the Carbon Neutral Government Programme (noting that schools and hospitals are some of the larger sources of emissions in the region).

[392] The Wanaka App (2024): Solar-powered EV charger car park approved for Three Parks
[393] Energy Efficiency and Conservation Authority (2024): Geothermal | EECA

COUNCIL INTERVENTION OPPORTUNITIES

Council intervention opportunities in the stationary energy sector relate to investigating how to drive efficiency, efficient consenting, and promotion of sustainable fossil fuel free lifestyles. The council intervention options have been categorised into three areas: energy generation, energy heat and distribution, and energy use.

Sitting above these categories is the opportunity identified above to bring a regional approach to energy. The regional energy inventory project is the first step to achieve this, and the opportunity is for councils to support this work and take its further into an energy action plan.

Energy generation

There will be investment opportunities created through the government's plans to double the use of low-emissions renewable energy by 2050. Working with the government through Invest New Zealand could help to locate national or international investment opportunities[394].

The region has several options to drive energy generation at both a grid electrification level or supporting end users (business and public) to adopt renewable energy technologies. Regionally there is a large proportion of biomass or LPG consumption for heating in homes, and there will be a big demand for electricity to power transport decarbonisation. All this consumption provides an understanding of the need to generate electricity or biomass for users. Grid decarbonisation should be the priority and national, regional and local support is needed to unlock funding to encourage the transition. Furthermore, local government is well placed to provide impartial advisory services to people and business on low-emissions energy generation.

Councils also have a role to support solar power opportunities, either through promotion of latest innovations or through direct funding (subsidies, loans or grants). Solar pricing at the household and commercial levels has decreased substantially over the last decade due to the decrease in costs of solar panels and their component parts, and solar has become more attractive because of an increase in life span and efficiency of the panels. Solar generation at the household level can be made more usable through battery storage technology. On the grid-scale level, investment in large-scale Battery Energy Storage Systems (BESS) is needed. The costs of this solution are decreasing with time, and the quality of available systems is increasing[395].

The Mackenzie District and Waitaki Valley have existing infrastructure which connects to the national grid via the 220kV transmission network from the Tekapo, Ōhau, and Waitaki Valley generation stations.

Energy heat and distribution

Energy distribution loss has not been calculated for Canterbury region, however, Transpower's 2024 national GHG inventory estimates that 63% of its emissions come from loss through the national grid[396]. Council planning and consents teams should consider the impacts of distribution loss when siting where new renewable generation project and other infrastructure lie, such as housing, commercial estates and transport.

[394] Invest New Zealand: Investment opportunities in NZ's renewable energy sector | Invest New Zealand
[395] Canterbury Mayoral Forum (2025). Canterbury Regional Energy Inventory 2025.
[396] Transpower (2024). Our carbon footprint: Our carbon footprint | Transpower

With the impacts of climate change likely to affect the peak load demands and distribution loss, energy security should consider the use of energy storage capabilities. This is important for communities where there may not be a sufficient diversity in renewables or other energy production. Councils can encourage and promote energy storage capability through planning and consenting functions.

Within urban areas there is the potential to capitalise on the recovery and distribution of heat. Biofuel technologies including methane capture at landfill or anaerobic digesters and agricultural manure ponds could be sources of this heat. This would provide low-cost heat to local users, which may include manufacturing facilities which generate a lot of energy through heating/cooling processes. As referenced in an earlier chapter, the Ecogas proposal for Christchurch is a good example.

Energy use

Low-emissions interventions for energy use should focus on the end user, with recognition that user behaviour influences change.

How energy is used, what energy sources are available, and cost of energy will drive change. Local authorities have an opportunity to ensure users are supported and encouraged to use energy efficient products and live a low-carbon lifestyle by establishing support mechanisms that sit across different sectors, focusing on the decarbonisation of the grid and the efficiency of the power used. This could include:

- planning and consenting – review consenting processes and capability for building and resource consents. This may require upskilling staff in regulatory compliance and energy efficiency. A procedural focus on early planning support and engagement can help anticipate issues at application and improve efficiency and easier adoption of low emissions abatement opportunities. Spatial planning frameworks need also to enable and encourage sustainable living
- guidance and information – council in Canterbury provides information to homeowners through their websites. There are also various businesses and government organisations that can offer support. A gap analysis of what information is available and how it is made available to audiences (householder, commercial) should determine a consistent message and solution through wayfinding of advice and guidance. This guidance would cover the spectrum of expected information users would require, including, energy technologies, funds and grants, efficiencies, disputes, planning requirements, and emissions transition targets
- process heat users may need improved information from biomass suppliers and electricity network owners about matters such as demand, load, supply and emission impacts of transporting biomass, to support making decisions about switching fuel
- funding – local authorities could consider reviewing current funding to help consumers or businesses invest in energy efficient and renewables technology, and consider providing support for some applicants subject to the NES greenhouse gas for industrial process heat regulations for the development of emissions reduction plans. Some existing subsidies could be reviewed to promote more energy efficient and low-emission outcomes.
- Building Code and energy performance information – Existing energy rating labels help consumers to choose lower energy and subsequently lower emissions equipment. The New Zealand building code requires some efficiency of homes and commercial real estate, however it is uncommon to see the efficiency for buildings at purchase. Canterbury councils could work collectively with central government and industry to amend the Building Code to

provide greater transparency for new and existing homeowners on measures to support energy efficiency.

- Skilled labour - An assessment of the gaps in decarbonisation skills needed in the region can help to understand what effort is needed to promote the migration of labour to New Zealand and the region. Local government could facilitate this as a regional project, or advocate with industry bodies and tertiary institutes for the work to be completed.

Related to the each of the above is the opportunity for councils to use local area energy planning processes as a way of contributing to emissions targets. Local area energy plans (LAEPs) have been used in Wales and other parts of the United Kingdom to provide a pathway to transform the energy system in a local area to lead to a net zero emissions outcome[397]. Orion is already supporting local area energy planning in Canterbury, leveraging best practice guidance from the UK, noting that the framework can be used to support more coordinated planning and investment, including with councils[398]. Selwyn District Council is currently embarking on area plans for Malvern, Ellesmere and Eastern Selwyn. These will include spatial identification of areas that could support new renewable energy generation in the future, as well as mapping the local distribution network and national grid needed to support this[399].

Carbon capture

As referenced in the international influences chapter, carbon capture from industrial processes could provide an opportunity as a removal source. In February 2025, the Government announced it had decided the key elements of a carbon capture, utilisation and storage framework for New Zealand[400]. While the concept is in its infancy in New Zealand, and not yet proven as a technology, there could be opportunities for councils to support or facilitate industry to work with the Government on better carbon capture and storage. Councils can support or encourage Canterbury businesses to be ready for these opportunities once the Government has completed its policy work and a framework is in place.

Transport

Transport is a key enabler of regional economic growth in Canterbury, but is also a large source of our emissions. In addition, Canterbury's transport emissions constitute 14 percent of national vehicle emissions[401]. As noted in the Background chapter, road emissions are the highest transport sub-sector emissions, contributing 13 percent of total regional emissions. Nearly 70 percent of the region's road transport CO_2 emissions come from light vehicles such as cars, SUVs, vans, and light trucks[402].

Further, Canterbury accounts for approximately half the freight moved around the South Island. As much as 87 percent of freight is carried within South Island regions rather than between them, and general freight volumes are expected to grow considerably in coming years – with an extra 47.7

[397] See Welsh Local Area Energy Planning - Arup
[398] Orion (2024). Submission to Electricity Authority: Orion.pdf
[399] Canterbury Mayoral Forum (2025). Canterbury Energy Inventory 2025.
[400] Minister of Energy and Climate Change (2025): Carbon capture one step closer | Beehive.govt.nz
[401] Environment Canterbury (2024). Transport Emissions: https://www.ECan.govt.nz/your-region/living-here/transport/regional-transport-planning/transport-emissions/#e11821 . Note these statistics cover travel on public rather than private roads, so therefore do not include diesel farm vehicles.
[402] Ibid

million tonnes of freight forecast to be carried in 2042 compared with 2012. This equates to an additional 1.7 million truck trips per annum[403].

Transitioning the transport sector has a range of challenges, but also presents opportunities for collaboration, as outlined in the tables on the following page. The sector is also one where local government has clear planning, funding and public transport levers to support the transition for households and industry.

[403] Environment Canterbury website: Freight | Environment Canterbury

BARRIERS TO TRANSITIONING

Barrier	Description
Geography and urban form	Canterbury's large geographic area and dispersed rural population pose challenges for developing and implementing effective public transport options. The majority of the region's population is concentrated in urban centres like Greater Christchurch and Timaru, while more rural areas have much lower population densities. Although there is a good network of community trust vehicles servicing these areas, this disparity impacts the provision of cost-effective public transport services in many districts, leading to a higher reliance on personal vehicles in some areas. Canterbury is one of the fastest-growing regions in New Zealand, with significant population increases in certain districts[404]. For example, Selwyn District experienced a 6.3% growth between 2006 and 2018, making it the second-fastest-growing territorial authority in New Zealand. Similarly, Waimakariri District saw a 3.5% annual population increase between 2013 and 2018. This concentrated growth in specific areas creates challenges in planning and evenly distributing transport infrastructure and services. Canterbury's rural communities live in a range of different topographic environments, many of which require vehicles that can cope with rugged terrain and flooded highways. With agriculture a prominent industry for the region, there is also a need for offroad vehicles. Although technology in offroad and farm vehicles is swiftly evolving and has resulted in an increase in suitable EV vehicles, diesel or petrol vehicle use remains prevalent. From a freight perspective, a barrier exists simply because many freight movements in Canterbury cannot be served by lower emissions options like rail or coastal shipping, meaning road freight will continue to have a major role to play on the region's roads in the years ahead[405]. However, the speed of the transition of the heavy vehicle fleet on the road away from fossil fuels will continue to be influenced by government policy.
Funding	Securing adequate funding for the necessary infrastructure upgrades (e.g., cycleways, public transport improvements, EV charging stations) can be difficult given competing budgetary demands. Despite being the second-largest region in New Zealand, Canterbury receives just over 7% of the total national contestable funding[406].

[404] Environment Canterbury: Population growth and its effect on transport | Environment Canterbury
[405] Environment Canterbury (2024). Transport Emissions: Transport emissions | Environment Canterbury
[406] Environment Canterbury (2024): From our Chair: Transport investment welcome - but funding gap remains | Environment Canterbury

	In 2023 the Canterbury Regional Transport Committee identified a funding gap of around $4.6 billion needed to fully implement the proposed $10.8 billion investment plan over the next decade[407]. This gap highlights the shortfall in available funds to meet the region's transport infrastructure needs. This includes requirements to increase electric bus fleet charging. Often infrastructure that benefits a low-emissions future, such as active modes or public transport, will be funded for and developed in more urban areas, rather than rural locations. Rural residents, because of their differing transport challenges to urban areas, have access to fewer or no public or active transport options and have to rely on using private vehicles in most cases to access amenities[408].
Access to technology	Access to technology can be limited in rural areas due to cost and infrastructure constraints[409]. Rural and remote locations often face challenges with internet connectivity which establishes barriers in the introduction of digital transport solutions, such as real-time public transport tracking, tracking truck, rail or shipping movements, and ride-sharing apps. While connectivity is improving in rural areas, it remains a risk[410].
Uptake of electric vehicles or alternative fuels	Current data shows that the uptake of electric vehicles is not yet near the level needed to electrify New Zealand's vehicle fleet, and is a barrier to transitioning the light vehicle fleet. As noted by EECA, by the end of this decade more than 50% of monthly vehicle sales in New Zealand need to be electric in order to meet our emissions reductions targets[411]. For example, in 2024, the market share of battery electric vehicles and plug-in hybrid electric vehicles in Christchurch was around 5.9%[412]. While these figures show a level of growth, they are still a small fraction of the total vehicle market. As of the end of 2024, fully electric light vehicles made up only 1.8% of the total light vehicle fleet in New Zealand. This indicates that the majority of vehicles on the road are still powered by traditional fossil fuel-dependent vehicles. For heavy vehicles, barriers include: • new vehicle technologies have limitations that can affect their ability to deliver a number of freight tasks – for instance, some EVs are limited by the weight of their batteries and/or the time it takes to recharge them, and while range is increasing, this is still limited in some available models. While fuel cell EVs have a greater range and faster refuelling, hydrogen technology is still somewhat in its infancy, and may not appeal to parts of the industry

[407] Environment Canterbury (2023): Proposal for $10.8 billion investment in Canterbury's transport system | Environment Canterbury
[408] Environment Canterbury (2024). Canterbury Regional Land Transport Plan 2024-34: CanterburyRegionalLandTransportPlan20242034.PDF
[409] R Babbage, Kirsten van Kessel, Agnes Terraschke, Juliet Drown, Hinemoa Elder (2020): Attitudes of rural communities towards the use of technology for health purposes in New Zealand: a focus group study | BMJ Open
[410] Rural News Group (2024): What's needed to improve rural connectivity?
[411] EECA website: Electric vehicles and Aotearoa | EECA
[412] EVDB, (2024): EV Market Stats 2025

	• the lack of availability of new technology - New Zealand is a small market player in the international vehicle market; high demand for these vehicles elsewhere is likely to result in greater availability in New Zealand only once these technologies are widely available elsewhere • there are ongoing sustainability concerns with EV and fuel cell batteries, in particular their production and disposal[413]. As well as electric vehicles, alternative fuels such as green hydrogen and biofuels also come with barriers. For example: • the supply of green hydrogen and biofuels is limited, and like electric vehicles the cost can be prohibitive – more work is needed to understand what feedstocks are feasible and where they could be grown to achieve this, or how these might be imported, and the prohibitive cost of producing hydrogen and biofuels needs to be more competitive with fossil fuels • sustainability of biofuel stocks is still a concern for many – to encourage their greater use, biofuels will need to demonstrate environmental sustainability of feedstocks over their full life-cycle[414].
Behaviour change	One of the most significant barriers for transitioning transport is behaviour change. This is also a key opportunity[415], as discussed further below. A 2022 study for Environment Canterbury showed that people were willing to change their behaviour to do more to reduce transport emissions, but that the key barrier was having the right infrastructure in the right place across the region to enable behaviour change – for public transport, active transport, and changing to low-emissions vehicles[416]. Without changes in travel behaviour, vehicle kilometres travelled in the Greater Christchurch area are expected to increase[417]. Although public transport patronage in greater Christchurch is increasing, there is not yet a commensurate increase in patronage to population growth[418]. Facilitating behaviour change toward active travel and public transport in urban areas is key to sustaining a low emission trajectory to 2050. Key barriers noted by survey respondents in Christchurch include insufficient infrastructure or dedicated infrastructure for bikes and walking, service levels and reliability of buses, and safety of users[419].

[413] Ministry of Transport (2020): Green-Freight-Strategic-Working-Paper_FINAL-May-2020.pdf
[414] ibid
[415] Regional Transport Committee (2024). Canterbury Regional Land Transport Plan 2024-2034: CanterburyRegionalLandTransportPlan20242034 (7).PDF
[416] Research First (2024). *Understanding attitudes about transport emissions in Canterbury*. Summary report available from: https://www.ecan.govt.nz/document/download?uri=4656566
[417] Ministry of Transport: Household travel | Ministry of Transport
[418] Environment Canterbury: Transforming public transport | Environment Canterbury
[419] Christchurch City Council (2023). Life in Christchurch transport survey results: Transport survey results : Christchurch City Council

	Behaviour change is also needed to encourage greater use of low-emissions vehicles, especially in areas in Canterbury that are not conducive to active or public transport. The market share of electric vehicles among light vehicles sold for Canterbury dropped from 16% in 2023 to 5.4% in 2024[420]. As noted above, new technologies, such as EVs, autonomous vehicles, and hydrogen fuel cells are constantly evolving – new technologies are yet to attain maturity and become as competitive as internal combustion engine vehicles, in terms of performance and efficiency. Their uptake so far is below than what is desired to register a meaningful impact.

RISKS TO TRANSITIONING

Risk	Description
Investment	Investing in evolving low-carbon transport technologies and associated infrastructure carries inherent risks for households and businesses. The two most significant risks in purchasing or investing in low-emission vehicles or related infrastructure includes the possibility of technological obsolescence (rather quickly) or unforeseen market disruptions (abrupt changes in demand patterns). For example, freight operators are concerned that new low and zero-emissions trucks will not be as reliable as diesel vehicles, and that expertise to maintain and service them is lacking. Uncertainty also exists about the performance of diesel vehicles that use higher blends of conventional biofuels, and total lifetime cost of ownership[421]. Households and businesses consider risks relating to the lack of charging infrastructure and EV range concerns remain as relevant as they were when these vehicles arrived on the market[422]. Investing in low-emissions alternatives to fossil fuel-based transport often have high upfront capital and slow and long paybacks, increasing the risk to invest[423]. For example, the cost of installing a single fast-charging station can range from USD$50,000 to $100,000[424]. Further, the payback period for electric vehicle charging infrastructure can extend over several years, depending on factors like utilisation rates and electricity prices. Energy decarbonisation and security will impact future electricity prices, which is why many sectors need decarbonisation of the grid to be a protagonist for low-emissions lifestyles. Details are still unclear on the two new rail-enabled ferries that will replace the current ageing fleet, other than they will be delivered by 2029[425]. Having two rail-enabled ferries (rather than just the current one) will greatly improve freight efficiency

[420] EVDB (2024): EV Market Share by Region
[421] Ministry of Transport (2020): Green-Freight-Strategic-Working-Paper_FINAL-May-2020.pdf
[422] Insurance Business Magazine New Zealand (2025): What's holding back NZ's transition to electric vehicles? | Insurance Business New Zealand
[423] OECD (2021): Investing in low carbon infrastructure
[424] World Bank blogs (2025): Investing in sustainable transport: Reducing the climate financing gap in LMICs
[425] Minister for Rail (2025): Rail ferries and straightforward infrastructure | Beehive.govt.nz

	between the North and South Islands, but as these will not be available until 2029 there remains risks in how quickly this can support more freight being moved by rail. Investment in sustainable aviation fuels is in its infancy in New Zealand and it may take some time to understand the opportunities this could present[426]. From an export perspective, many of New Zealand's customers are a long way away and there is growing concern about food miles and sustainability[427], meaning that investment in sustainable aviation (and shipping) fuel could become a more pressing issue for New Zealand from an economic perspective in the future.
Policy settings	National-level policy settings and incentives have changed significantly in the last two years, increasing some risks relating to the speed and nature of decarbonising transport in New Zealand. The Climate Change Commission[428] notes that the changes that will create the most risks to meeting emissions targets for transport include: • the withdrawal of the clean car discount • the policy direction of the Government Policy Statement on Land Transport toward roading and away from public and active transport • the closing of the Climate Emergency Response Fund. The GPS for land transport includes public transport funding, but only for Auckland and Wellington[429]. Without policy and financing to encourage the development of low-carbon liquid fuels for light vehicle transport, it is unlikely that the carbon intensity of fuel used in the existing fleet will reduce. This places additional reliance on the uptake of EVs to achieve the emissions budgets. Policy settings relating to energy are also a risk for decarbonising transport. A risk in electrifying the heavy vehicle fleet is the subsequent increased electricity demand on the network and the impact this would have – better management of increased demand for electricity, especially during peak periods, and in specific areas of the country with less developed infrastructure would be needed to overcome this[430]. This can also apply to the light vehicle fleet.

[426] Air New Zealand (2024): New study shows local production of sustainable aviation fuel could support fuel resilience and security in Aotearoa New Zealand - Media releases
[427] See the Overview chapter on international influences for more information.
[428] Climate Change Commission (2024): monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf
[429] Ministry of Transport (2024): Government-Policy-Statement-on-land-transport-2024-FINAL.pdf
[430] Ministry of Transport (2020): Green-Freight-Strategic-Working-Paper_FINAL-May-2020.pdf

OPPORTUNITIES FOR TRANSITIONING

Opportunity	Description
Infrastructure	Support the Government's goal of 10,000 public EV charging points by 2030 through: • identifying where the need is for charging stations in the region • identifying possible collaborations to facilitate investment in charging infrastructure • considering how charging infrastructure can be facilitated through the consenting process (i.e. inclusion in consent conditions). Although expensive, electric charging stations are relatively quick to deploy. In addition, the existing network can be leveraged to develop fast-charging hubs for trucks[431]. Support job creation for transport infrastructure and supply and servicing of low-emission vehicles through coordinating with industry and business advocacy groups, as well as tertiary education providers to ensure there is appropriate training for the skills that will be needed throughout the transition. Support the work of the Regional Transport Committee in enabling freight mode shift to shipping and rail where possible, and consider how to support decarbonisation of ports and airports. Support continued advocacy to improve rural connectivity to take advantage of the latest digital innovations, building on past Mayoral Forum projects to resolve mobile blackspots on state highways and local roads[432].

[431] Ministry of Transport (2020): Green-Freight-Strategic-Working-Paper_FINAL-May-2020.pdf
[432] Canterbury Mayoral Forum (2022): Mayoral Forum achievements 2019-2022

Mobility	A key opportunity for local and central government together is to ensure investment is made across the region for public and active travel, and increase efforts to promote behaviour change. *Active travel* Active travel commonly includes walking and cycling (traditional bicycles and e-bikes) but could also cover modern modes such as scooters, skating, skateboarding and more. The socio-economic benefits of active travel are significant, with investment providing a much higher return on investment[433]. The benefits reach wider with impacts promoting health and wellbeing, reducing the pressure on Health New Zealand. Active modes can also be a low-cost solution for communities and people with low social mobility or access to private vehicles. The 2018 census suggested that 5.8% of Canterbury households did not have access to private vehicles[434]. Active travel is different for different towns and areas in the region. For more rural or remote areas, investment in road safety and quality are opportunities to consider, while for more urban areas there are opportunities to create or improve the safety of cycleways, cycle infrastructure and pedestrian-friendly areas[435]. *Public transport, carpooling and vehicle sharing* The Canterbury Regional Land Transport Plan signifies the importance of establishing improvements to the bus network and moving towards electrification of the bus fleet[436]. With only a 4.2% patronage for bus use amongst commuters in Canterbury, there is a big opportunity to shift the dial on patronage through encouraging behaviour change. Continuing with initiatives such as increasing the frequency of buses on some routes is one opportunity, as is improved reliability, safety and better bus infrastructure (covered stops, bus lanes and so on), as well as improving connections between buses/lines, and considering development of park and rides. Continued advocacy for a mass rapid transit system for Greater Christchurch, perhaps as part of any regional deal, is another clear opportunity. For smaller or rural areas, some opportunities to consider are: • on-demand public transport systems (such as variations on MyWay) either within or between smaller towns • greater support or rollout of vehicle trusts • improved bus or carpooling options to get children to school.

[433] IPPC (2024): Stride and ride: England's path from laggard to leader in walking, wheeling, and cycling | IPPR
[434] Figure.nz census data: New Zealand households with no private vehicles available for use - Figure.NZ
[435] Research First (2024). *Understanding attitudes about transport emissions in Canterbury*. Summary report available from: https://www.ecan.govt.nz/document/download?uri=4656566
[436] Environment Canterbury (2024). Available from: CanterburyRegionalLandTransportPlan20242034.PDF

	The Canterbury Regional Public Transport Plan sets out ways in which to grow patronage on the region's public transport services, which align with the above.
Facilitation	Raise awareness of the range of funding and financing options already available for industry to decarbonise light and heavy vehicles (through EECA, the Provincial Infrastructure Fund, and others) Support coordination efforts in the transport (and particularly freight) sector on sustainability and emissions reduction alongside industry associations
Investment	A bill is currently before Parliament to allow councils to utilise time of use (congestion) charging. If passed, this presents an opportunity for councils to encourage behaviour change away from cars, and may present an opportunity to use funds from charging to benefit low-emissions initiatives. A fuel tax is another option, but is not favoured at a national policy level. There also remains an opportunity to continue advocating for aligning timing of NZTA funding with that of council annual plans. This would provide much better clarity for councils on what transport projects will be funded or co-funded by the government prior to signing off their annual plan each year.
Hydrogen	If methane in the region could be captured from landfill and agriculture, then there is the potential to create a blue hydrogen industry in Canterbury to support transport decarbonisation. In addition, New Zealand has the potential to produce green hydrogen for transport. Biofuels could have an immediate impact on GHG emissions as they can be used in existing vehicles and infrastructure[437]. As noted in the 2024 Canterbury Regional Land Transport Plan, some land transport suppliers consider that hydrogen may be the preferred long-term option for communities in Canterbury for longer distance light vehicle travel and all heavy vehicles. This is because of confidence levels in hydrogen vehicles to undertake the length of trips in Canterbury winter conditions as well as nature of the waste emitted from vehicles long-term[438]. As referenced in the emissions reduction initiatives chapter, Fabrum and Tāwhaki are working together on identifying clean and renewable energy production options, including producing and storing green hydrogen at Kaitorete. There is an opportunity to support this work and its outcomes, particularly as the outcomes could facilitate the use of sustainable aviation fuels.

[437] Ibid

[438] Regional Transport Committee (2024). Canterbury Regional Land Transport Plan 2024-2034: CanterburyRegionalLandTransportPlan20242034 (7).PDF

COUNCIL INTERVENTION OPPORTUNITIES

A strong mandate to reduce transport emissions regionally is found through the Canterbury Regional Land Transport Plan and the Canterbury Regional Public Transport Plan[439].

Public and active transport

For public transport, increasing patronage is a key opportunity and within council levers to achieve. The draft Regional Public Transport Plan lays out how this will be done:

- concentrating investment on frequent routes
- increasing service frequency
- improving reliability through improved infrastructure
- improving the customer experience.

A longer term opportunity is to implement the plans for mass rapid transit in Greater Christchurch[440].

There are also opportunities to, in time, scale up the MyWay service in Timaru and roll out similar or adapted systems in other smaller urban areas. The success of MyWay has seen interest raised in it elsewhere, such as Ashburton[441]. This, alongside continued support for community vehicle trusts for more rural or remote areas[442], could significantly reduce emissions in smaller urban areas through providing a range of transport options.

There is also significant opportunity to encourage greater use of e-bikes in cities and towns. E-bikes are more affordable than electric vehicles, go much faster and can be used for longer distances than traditional bicycles, and enable door-to-door transportation[443]. Councils can encourage use of e-bikes through designing or upgrading transport networks that allow for their safe use. Councils could also consider increasing uptake through initiatives like e-bike loan schemes[444].

These opportunities will require ongoing council support and continued advocacy with the government to secure necessary co-funding or investment. Investigating public-private partnerships, taking advantage of financing mechanisms like the LGFA will be key. Continued support across the region for a zero emissions bus fleet by 2035 is also necessary.

Significant infrastructure projects, such as mass rapid transport for Greater Christchurch, could also form part of the case for a regional deal in Canterbury. A mass rapid transport system, along with a connected network to enable intra-regional transport, would have significant co-benefits for health, social and economic outcomes, allowing people mobility choices to access education, work, health facilities, leisure and wellbeing amenities and more, as well as fostering a sense of place and community at local and regional scales.

There are related opportunities for active transport in both urban and rural areas, as outlined above, and there are opportunities to integrate active with public transport. Christchurch's network of

[439] The Canterbury Regional Public Transport Plan is currently in draft form but will be adopted by the end of July 2025: Regional Public Transport Plan
[440] Ibid
[441] Jonathan Leask (2024). Scoop.co.nz: Business.Scoop » Ashburton Starting Road To Public Transport Trial
[442] Currently, there are 17 Community Vehicle Trusts operating across the region in Kaikōura, Hanmer Springs, Cheviot, Amuri, Hawarden-Waikari, Amberley, North Canterbury, Darfield (Malvern), Ellesmere, Ashburton, Geraldine, Fairlie, Twizel-Tekapo, Temuka, Pleasant Point, Waimate and Waitaki Valley.
[443] New Zealand Transport Agency (2025): Research Report 732 - E-bike support schemes and transport equity - March 2025.
[444] Ibid

cycleways is a good example, where cycleways and pedestrian walkways are connected to bus routes[445]. For larger urban areas like Christchurch, there may be opportunities to encourage more active transport through initiatives like London's ultra low emissions zones or Stockholm's planned emissions free zones, and to learn from Auckland's implementation of mass rapid transport[446].

Light vehicle fleet

Local government has levers to support and encourage charging infrastructure for electric vehicles, as identified in the opportunities table above. Councils could work with government agencies to understand where the need is for charging infrastructure across the region, bring together various key actors to facilitate investment in charging infrastructure, and identify how regulatory levers could be used in consenting processes to incentivise more infrastructure (such as through consent conditions). Funds raised from congestion charging schemes could also be used on land transport initiatives that promote mode shift or switching to low-emissions vehicles.

Councils also have a role in incentivising individuals and businesses to adopt alternative fuels or EVs. They can raise awareness of the range of funding and financing opportunities to transition vehicle fleets, and share information on latest developments in new technologies, through platforms like *It's time, Canterbury*. As noted in the energy section, there is a significant opportunity for councils through the development of the energy inventory and its next steps to support a regional strategy or action plan for energy.

Councils could also consider collaborating with government and/or industry to consider developing a scheme like the clean car discount, and could consider using regulatory levers to encourage uptake of low-emissions vehicles, such as free parking and access to bus lanes for EVs[447].

As well as EVs, councils can support the development of blue and/or green hydrogen industries in Canterbury to support transport decarbonisation. Councils can support this through highlighting pioneering research, such as that being done at Kaitorete, or through committing funds to support the development of a wider industry in Canterbury. Like mass rapid transit, this could form part of a regional deal with the government, or put forth for consideration under the Provincial Infrastructure Fund (if outside Christchurch).

Freight and heavy vehicles

Councils are already working to support moving freight from the road to rail or coastal shipping, as evidenced in the development of the Fairfield Freight Hub in Ashburton and the memorandum of understanding between KiwiRail and the Selwyn District Council to consider developing a large freight hub in the district. Continuing to enable moving freight off roads and on to trains or ships will remain a key priority of the work of the Regional Transport Committee.

Councils can also play a key role to support coordination efforts in the freight sector on sustainability and emissions reduction. Councils are well-placed to bring the industry together to discuss these issues, and facilitate connections between local government, central government and industry to

[445] See, for example, the Christchurch City Council's transport plan: Christchurch Strategy Transport Plan 02.indd

[446] See New report reveals the transformational impact of the extanded Ultra Low Emission Zone so far | London City Hall; 5 sustainable mobility measures set to make Stockholm a net zero city by 2030 | UITP and Auckland Council: Rapid transit network

[447] The city of Oslo implemented a similar policy alongside a large network of charging stations. By 2023 over 60% of new car sales in the city were EVs: The World's First Mass Market for Electric Vehicles – The Oslo Case Study – CNCA

identify collaboration opportunities through the Regional Transport Committee. Councils can also share information and provide data to support the industry to move away from fossil fuels[448], and continue to advocate with central government on national policy settings.

Highlighting the ways in which freight companies can access investment to support decarbonisation is also something councils are well-placed to do. Ensuring that companies, particularly smaller, regionally based freight businesses in the region are aware of the funding EECA provides, as well as opportunities through the Provincial Infrastructure Fund and the range of green loans that may be available can encourage moves towards decarbonisation.

[448] See, for example, research commissioned through the Regional Transport Committee to understand people's views on transport emissions: https://www.ecan.govt.nz/document/download?uri=4656566, and research commissioned by the South Island Regional Transport Committee Chairs Group on opportunities for shifting freight from road to rail in the South Island: Rail freight takes pressure off roads | Environment Canterbury

Waste sector

Waste emissions primarily come from solid waste disposal through landfill activities, where methane gases are produced through the decomposition of organic materials. Wastewater treatment and discharge make up the second source of emissions. Given the greater representation of emissions from solid waste disposal, this will be the focus for this section.

BARRIERS TO TRANSITIONING

Barrier	Description
Accuracy of data	Waste emissions data has flaws both regionally and nationally. At the regional level, it is estimated that data is available only for 20% of the waste that is generated in the region, which reflects the complexity of the waste management system and differences in the way data has historically been collected across the region. There are particular data gaps relating to commercial operators, processes that do not lead to landfilling, and waste that is transported out of the region[449]. Data is either old or carrying levels of uncertainty[450]. The lack of data impacts the ability for New Zealand central and local government to make effective decisions, including infrastructure investments, scope and scale of services, monitoring performance and developing effective policies and controls[451]. Part of the difficulty in waste data for Canterbury is the complexity of its large rural geography. Many communities and waste management facilities are in remote areas, sometimes without effective oversight, meaning that data is therefore not collected and opportunities missed for management.
Approach to waste	New Zealand households produce more solid waste per capita than any other OECD country[452]. Total waste quantities have risen annually since 2009 from 2.9 million tonnes to 8 million tonnes[453]. This demonstrates a level of overconsumption, which combined with single use products, and an over-reliance on landfills, acts as barrier to achieving emissions reductions in waste at both a central and local level.

[449] Canterbury Waste Joint Committee (2022): Canterbury Waste Data Gaps Analysis: Agenda of Canterbury Waste Joint Committee - Monday, 5 September 2022
[450] Ministry for the Environment (2024): Improving waste data | Ministry for the Environment
[451] New Zealand Infrastructure Commission (2021). Sector State of Play: Resource Recovery and Waste: sector-state-of-play-resource-recovery-and-waste.pdf
[452] New Zealand Infrastructure Commission: How do we stop throwing so much away?
[453] Ministry for the Environment (2023): Waste statistics | Ministry for the Environment

	For rural and remote areas, of which there are many in Canterbury, an additional barrier is that these communities do not have the same access to waste management options as urban communities. It is estimated that up to 50 different types of waste are produced on farms each year[454], and being able to dispose of this properly is a barrier for some.
Behaviour change	Support for changing individuals, households and businesses' behaviour to avoid waste in the first place is a barrier to improving waste reduction. Overcoming this barrier would mean much less effort is required to manage and dispose of waste. An example of how behaviour influences how New Zealanders think about waste can be found in a study conducted by Fair Go found that public recycling of waste discarded in public bins across New Zealand is low[455]. The issues are threefold: • manufacturers are not providing sufficient information on the recyclability of their products • there is not sufficient provision of public place recycling bins with clear signage for separations • the public are not educated on waste management in public places. In Canterbury, Christchurch had a significant issue with behaviour following Covid lockdowns, where significant amounts of recycling collected in the city had to be taken to the landfill because people were not using the recycling bins properly[456]. One year on, behaviour was still an issue for some households despite education campaigns and warnings[457].
Capturing methane	Landfill is one of the largest sources of methane. Canterbury has the largest quantity of registered waste facilities in New Zealand, with 73 disposal sites registered as Class1-5 landfills and 28 registered transfer stations[458]. Adequate and effective methods to capture methane in landfills is a barrier, with the Climate Change Commission noting that there is a moderate risk to achieving necessary levels of landfill gas capture to meet the target of 30% biogenic methane emissions reduction between 2020 and 2030[459]. Further impacting this is there are inadequate solutions to managing organic waste in landfills[460], which is a core ingredient in the development of methane gases.

[454] Environment Canterbury: Waste minimisation and management | Environment Canterbury
[455] 1News (2023): Vast majority of mixed recycling from public bins ends up in landfill
[456] Radio NZ (2020): Council runs cost of Christchurch households' rogue rubbish habit | RNZ News
[457] New Zealand Geographic (2021): Recycling bins confiscated after the wrong rubbish in | New Zealand Geographic
[458] Ministry for the Environment (2024): Waste facilities and disposal | Ministry for the Environment
[459] Climate Change Commission (2024). Monitoring Report: Emissions reduction: Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf
[460] Manaaki Whenua & Zero Waste Network (2023). *Scaling-up, scaling-out & branching-out: Understanding & procuring diverse organic materials management models in Aotearoa New Zealand*: Composting Report - Final 3.pdf - Google Drive

RISKS TO TRANSITIONING

Risk	Description
National policy settings	There is a risk that the current national policy approach will not facilitate meeting emissions waste targets. *Waste strategy and funding* With 40-50% of construction waste going to landfill and an acknowledgment that regionally, construction aggregates are a risk and high priority waste[461], greater national direction is needed to tackle the issues. There is currently no existing strategic infrastructure plan that can guide efficiencies of the investment spend and provide a baseline for regional development of planning, particularly the missed opportunities around a circular economy. The current waste and resource efficiency strategy is light on detail about how emissions from waste will be reduced[462]. Access to funds and investments for reducing waste emissions are limited which may hinder the transition. Currently, the Waste Minimisation Fund provides $100,000 or $250,000 grants, but they are only available for a selection of initiatives[463]. LGNZ has also raised concerns that a policy shift is being considered at the national level could see a change to the 50/50 split between central and local government from the proceeds of the waste levy. There is a risk that changes to the split would result in councils receiving 75% less income than they do now for waste initiatives[464]. A budget 2024 change to the way the government portion of the waste levy proceeds are spent may also impact the speed and nature of waste emissions reduction in New Zealand. The policy change sees only some of the government portion going into the Waste Minimisation Fund, while the remainder will be diverted to support other environmental initiatives (such as freshwater improvement or cleaning up contaminates sites[465]. *Landfill gas capture* Financing the installation of landfill gas capture must be undertaken by the owner of the facilities. There are economic impacts to this whereby waste acceptance rates or 'gate fees' could increase with costs passed on to ratepayers. This could lead to illegal practices (burning or dumping).

[461] Environment Canterbury: Waste minimisation and management | Environment Canterbury
[462] New Zealand Government (2025): The Government's waste and resource efficiency strategy
[463] MfE website: Waste Minimisation Fund | Ministry for the Environment
[464] LGNZ (2024): Government changes to water and waste levies will push up rates - LGNZ
[465] New Zealand Government (2024). Budget Factsheet: Factsheet: Waste Levy changes - 30 May 2024

	Further, there is no requirement for landfill gas capture systems at non-municipal landfill sites. Methane gases are emitted without capture and without energy recovery. Without effective control, there is a risk that landfill owners could continue emitting and performing unsustainable waste management practice out of line with a circular economy.
Public opposition to new technologies	New technologies such as waste to energy facilities have limited presence and understanding in New Zealand. The impacts and risks are commonly perceived to be high, including those that impact community health and the environment. These concerns however are more relevant to older technologies, with new waste to energy facilities operating with much great scrutiny. Stringent planning and regulatory consent requirements are needed to ensure that communities are informed and protected from any potential hazards.
Skill gaps	Introducing new waste technologies in New Zealand will likely require the development of skills in the region and/or sourcing international talent. Without competently skilled labour, particularly from countries who already use innovative waste management technologies, it may be difficult to change common waste management practices.
Planning and timescales	Solutions are needed now to meet emission budgets and 2050 targets. Current technologies undergoing consent in the region include the anaerobic digestor in Christchurch[466] and the Waimate waste to energy plant[467]. Most infrastructure projects have a long lead time in their design and construction which can be resource intensive. For example, if consented, the Christchurch digestor would still take 3 years from award, consent and commissioning.

[466] Environment Canterbury: Ecogas - Ōtautahi/Christchurch Organics Processing Facility | Environment Canterbury
[467] Environment Canterbury: Waimate waste-to-energy plant | Environment Canterbury

OPPORTUNITIES FOR TRANSITIONING

Opportunity	Description
Effective data management	Improving data management enables accurate reporting, baselining and progress review. The Ministry for the Environment has presented details on its work to improve waste data in New Zealand which local government could help steer in its delivery[468]. Even without the impending improvements there is a lot of waste information available in New Zealand at central or regional levels of government that should be used to understand public attitudes to help drive change[469]. Waste assessments should include a review of data management practices of the supply and value chains over waste management's lifecycle within the area of each local government boundary. The output can help further the actions of the Canterbury Waste Joint Committee on data management.
Public awareness and education	Councils can lead awareness campaigns and initiatives to improve waste avoidance, and promotion of reuse and recycling[470]. Councils also have a key role in promotion of available funding streams for industries, businesses and community groups, such as the Waste Minimisation Fund, to increase innovation[471]. Circular economy principles are an under-utilised solution that require both internal upskilling and planning before being able to inform the public on efforts to deliver improvements. Councils have an opportunity to learn from each other about how they are implementing circular economy principles in their district. The construction and demolition industry provides a big opportunity regionally to focus efforts to develop solutions, linking developers, construction companies, suppliers and waste facilities to develop solutions.
Energy recovery	Greater effort is needed for the recovery of energy from waste ahead of disposal practices. Although there are 59 registered class 1-4 landfill facilities in Canterbury, only Kate Valley landfill recovers energy from methane gas[472]. Investigations are needed to determine how to capture landfill gas from some or all of the remaining landfills. There are also opportunities to investigate the appropriateness of incineration of waste as complementary to other initiatives. For example, incineration could halve the emissions of an equivalent energy recovery landfill facility. Municipal solid waste

[468] Ministry for the Environment (2024): Improving waste data | Ministry for the Environment
[469] Ministry for the Environment (2023): Research into attitudes to waste and recycling | Ministry for the Environment
[470] See, for example, the Christchurch City Council's webpage: Other recycling schemes : Christchurch City Council
[471] Ministry for the Environment: Waste Minimisation Fund | Ministry for the Environment
[472] Transwaste (2025). Introducing Kate Valley: Kate Valley – Transwaste

	incineration is −0.179 t CO2 eq./t while landfilling is 0.395 t CO2 eq./t MSW50. Councils would need to work with householders to improve source separation, especially organic waste separation in addition to improving transfer station operations to increase waste separation. Europe leads the way in waste to energy incineration and lessons could be learnt through its experience[473]. If approved through the consent process, Ecogas' planned facility in Christchurch will create useful learning for the rest of the region on anaerobic digestion technology. This is the start of a necessary transition to using greener technology to manage waste. This technology is available at all scales, from industrial or municipal waste treatment facilities to systems that fit in the car park of the local hospital or manufacturing facility, such as the Flexibuster for use on farms[474]. Through funding from the Waste Minimisation Fund and/or other sources, councils should investigate how and where these technologies could fill gaps in existing waste management practices, particularly in rural and remote locations.
Circular economy	The benefits of a circular economy are well documented for reducing emissions. For four key industrial materials (cement, steel, plastic and aluminium) circular economy strategies could help reduce emissions by 40% in 2050[475]. A review of Canterbury district council waste management plans show only Christchurch, Waimate and Timaru reference a circular economy, so there is an opportunity for all councils to do so, and be regionally aligned in the process.
Waste avoidance and reduction	Waste reduction is a prominent topic in all council waste management plans, however, as is evident in the increased waste tonnages, it is a difficult issue to resolve. Organic waste is a prime source of methane emissions regionally and should be a focus. Councils can support community efforts to reduce waste through continuing with education campaigns and supporting or promoting the efforts of not-for-profits involved in efforts to reduce food waste.

[473] See berl (2019). Waste to energy, The incineration option: BERL Report WtE final July.pdf
[474] SEAB Energy: Small anaerobic digester for farms: Small Farm Anaerobic Digester - SEAB Energy
[475] Ellen McArthur Foundation (2024): Completing the Picture - How the circular economy tackles climate change.pdf

COUNCIL INTERVENTION OPPORTUNITIES

Councils play a key role in a supporting and implementing a circular economy. Canterbury councils can deliver a circular economy at a regional scale to share resources and stimulate growth equitably. The Canterbury Waste Joint Committee is likely to have a significant role to play in this. Recommended approaches are set out below. These interventions could be supported by a regional approach to waste, led by the Joint Committee, based on circular economy principles.

Waste avoidance and generation

Behaviour determines what becomes waste.

Canterbury councils can work together to promote waste avoidance as the primary goal, resource recovery, and product stewardship, and advocate for funding to support this work from central government. The funding could be used to for direct council initiatives or to support community-based non-government organisations already working in this area.

Canterbury councils should explore together through the Canterbury Waste Joint Committee how best to engage with people to reduce and sort waste at source, either regionally or sub-regionally. This may include direct engagements, running promotional campaigns, reviewing visual media used for bins and in guidance. This also includes greater promotion of Committee's waste minimisation grant for projects in the region.

Waste separation

Organic waste should be a priority waste for source segregation due to the methane production at existing landfill facilities. Councils have an opportunity to work together to promote consistent practice across the region's landfills.

Waste collection

Waste data is an existing barrier that hinders the region's understanding of waste and materials management. Councils, through the Canterbury Waste Joint Committee, can work to improve the data around the waste materials that are being generated and need collecting. Effective waste data can help facilitate recovery and disposal solutions in line with emissions reduction opportunities.

Canterbury councils can also look to leverage their contracts with waste management companies to invest in waste infrastructure and assets to improve collection and disposal services. This could include AI-enabled data collection, electric waste collection trucks or low-emissions multi-waste source collection rubbish trucks[476].

Waste/resource recovery

Councils should investigate how to stimulate a regional waste and materials recovery industry through the following principles:

- Repurpose – councils could improve the management of organic wastes, particularly organic matter that may be developed from future anaerobic digestors. The biosolids could have multiple purposes as fertilizers, but planning requirements would need to be reviewed for their acceptance in end use
- Reuse – Aggregates from construction including concrete can be reused for other engineering purposes. Councils could review their own engineering standards to examine

[476] Such as those being brought in by Waste Management as part of its emissions reduction initiatives - Why use two when one will do? : Newsline and WM New Zealand's Journey to an Electric Fleet.

where some materials could be reused across other infrastructure and building projects across the region
- Refurbish – councils could work in partnership with small enterprises to establish community refurbishment facilities to give old products a new life.
- Recycle – the idea of deposit return schemes has recently re-emerged in some quarters[477]. Councils could seek to partner with central government to enable the introduction of a scheme or work collectively in the region to develop it together. There are also opportunities to build on current battery recycling schemes, for example[478].

Energy recovery

Where waste has undergone screening to remove valuable materials and resources, the residual material can be sorted into refuse derived fuels or other feedstock for recovery through waste to energy. The Canterbury Waste Joint Committee could work to understand regional demand and feasibility of technologies, and identify locations for facilities that can develop energy from waste and how to utilise for maximum benefit.

Typically:

- anaerobic digesters could be used in rural areas for agricultural and wastewater waste
- energy captured could be diverted to manufacturing facilities to decarbonise operations away from coal use
- heat networks could be developed from plants, routing heat to local authority operated or owned buildings or social housing developments and or manufacturing and industrial areas.

Waste disposal

Landfill should be the last solution after exhausting all other solutions. Council waste operations teams could work together through the Canterbury Waste Joint Committee to:

- consider limiting the number of licences given to facilities to operate in the region and the implications of this
- consider the feasibility of utilising landfill gas capture technology in landfills that do not currently use it
- plan strategically for the region's future landfill needs when the larger landfills (such as Kate Valley and Redruth) reach capacity.

[477] See RNZ (2025): Push for recycling scheme re-emerges, with broad support for bottle deposit | RNZ News
[478] See Battery Collection Facilities | Hot Topics | Our Work | WasteMINZ for examples of current recycling schemes.

Industrial processes and product use sector

The IPPU sector covers greenhouse gas emissions resulting from various industrial activities which are not directly the result of energy consumed during the process. This includes emissions from industrial processes that physically or chemically transform materials. IPPU emissions are 2% of the region's total emissions. This matches national data.

Fluorinated gages (F-gages), dominated by refrigerants, is the headline regional IPPU greenhouse gas. The types of F-gases used within New Zealand include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6)[479]. Stationary air-conditioning and commercial refrigeration are the leading emissions sources.

BARRIERS TO TRANSITIONING:

Barrier	Description
Alternatives compatibility	All hydrocarbons, such as those used as refrigerants, are classified as flammable; however, some alternatives may contain a higher flammable risk than others, particularly in different equipment / uses. The risk of equipment failure can be greater should refrigerant equipment be maintained and retrofitted with a non-standard or non-manufacturer approved alternatives[480]. With the introduction of new refrigerants there may be some burdened costs put onto equipment owners that may not previously have been an issue. One of the costs to using newer / alternative refrigerants is the requirement to review the whole refrigerant system and design changes that ensure legal compliance. If systems are not properly designed and upgraded, then repeat failures may develop or issues could lead to a drop in equipment efficiency and f-gas leaks. These could develop negative perceptions on the F-gas alternatives and the energy efficient technologies that they often associate with (such as air source heat pumps). This could lead to fewer uptakes in the technology.
Skills	Through the adoption of F-gas alternatives, there will be the requirement to ensure installers, maintainers and disposal operatives are fully trained and licenced to handle products[481]. Studies in Europe, where new F-gas regulations are to be introduced, suggest there is a gap in trained technicians[482]. As the European Union is considered a leader in F-gas management, that gap is likely to be wider in New Zealand. If the labour market

[479] Ministry for the Environment (2022): Fluorinated gases | Ministry for the Environment
[480] WorkSafe: Hydrocarbon refrigerants | WorkSafe
[481] Ibid
[482] Cool-safe (2025): F-gas engineer forecasts are underestimated

	does not have the relevant competencies to be able to meet new legal obligations, then the adoption of new refrigerants could be met with some push-back.
Disposal	New Zealand greenhouse gas inventory data indicates that the estimated quantity of F-gases recovered from products at disposal increased to a new high in 2022, totaling 0.169 MtCO2e, or around 11% of total F-gas emissions in 2022[483]. That suggests there is a big gap in the need for proper recovery. Roughly half of all emissions from F-gases occur during disposal, so efforts are needed to collect and recover F-gases ahead of other disposal methods currently used, which includes the export of refrigerant as waste. Aotearoa New Zealand's first and only refrigerant destruction facility – the Kawerau F-Gas Destruction Facility – is currently under construction[484]. With the second largest quantity of F-gas emission in New Zealand, Canterbury does not have effective management facilities for the disposal of F-gases and relies on external facilities.

RISKS TO TRANSITIONING

Risk	Description
National policy settings	CoolSafe, an industry-designed product stewardship scheme for refrigerants, advises that New Zealand has limited regulatory levers that govern the sale, management and disposal of F-gases in an environmentally responsible way[485]. In 2022, the Ministry for the Environment undertook public consultation on a proposal to control imports of pre-charged equipment containing high Global Warming Potential F-gases and to investigate prohibiting F-gases where low Global Warming Potential alternatives are available. No further progress has been made to address these emissions reduction plan actions. This poses a risk to the delivering immediate action to manage sector greenhouse gas emissions.
Refrigerant demand	If f-gases are not phased out effectively, an increase in demand for them could see a corresponding increase in emissions. This is because:

[483] Stats NZ (2022): greenhouse-gas-emissions-by-region-industry-and-household-year-ended-2022.xlsx
[484] Cooling Post (2023): New Zealand to install refrigerant cracking plant - Cooling Post
[485] CoolSafe (2024): Media release- Dealing with a cool 2% of our greenhouse gas emissions

	• Canterbury has a large manufacturing industry which requires refrigerants, particularly in the dairy and cattle industry • Christchurch has the second largest population in New Zealand and the transition to decarbonisation of home renewables such as heat pumps will require more refrigerants for their operations • Canterbury is tipped to be a significant site for the digital revolution, with tech industries seeking to tap into the availability of renewable energy to offset the emissions from data centres[486]. The significant impact of data centres is the high demand for cooling.
Supply chain availability	New Zealand's economic geography and institutional context means that New Zealand has one of the most exposed supply chain positions across advanced economies. For F-gases it includes risk to access of HFCs, PFCs and SF6 or access to fuels which will produce new low emission alternative refrigerants[487]. The Climate Change Commission echoes this, suggesting that the limited uptake of readily available low GWP F-gas alternatives in New Zealand may impact the effectiveness of HFC phase-down efforts over the longer term[488].

OPPORTUNITIES AND POSSIBLE COUNCIL INTERVENTIONS

For IPPU emissions, Canterbury councils' opportunities to support reduced refrigerant gas emissions lie in taking a life cycle systems approach. This would include interventions that drive refrigerants production and import, use, installation / maintenance, and decommissioning / disposal.

Opportunity	Description
F-gas industry	Sufficient capacity is needed within the supply chain to support the supply of non-HFC gas and products. Local authorities could support a review of business practices to ensure compliance with operating licences and legislation. Councils could work collaboratively to engage with industry to ensure they have the right information to make informed decisions for switching to alternative refrigerant gases. This could include considering the feasibility of implementing incentives to enable operators to voluntarily make low emission decisions.

[486] See, for example, this media story from 2024: Will there really be a $10b AI data centre on this Rakaia dairy farm? | The Press

[487] Landfall Strategy Group (2022). *Supply chains to the last bus stop on the planet: An international perspective on strengthening New Zealand's supply chain resilience*: pc-inq-ier-supply-chains-to-the-last-bus-stop-on-the-planet.pdf

[488] Climate Change Commission (2024): *Emissions reduction, Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target*: monitoring-report---emissions-reduction---july-2024--final-web-ready.pdf

Planning interventions	One proposed method for minimising F-gases would be to improve the energy efficiency of buildings to reduce the requirement air conditioning. This would require detailed scrutiny of building planning applications and engagement with developers to shift their perspective on efficiency. This opportunity would be dependent on collaborating with central government to develop effective building codes and F-gas regulations. Councils could also build stronger connections with manufacturers to promote and find ways to support their adoption of low emission alternatives. Alternatively, councils could consider the feasibility of simply prohibiting the use of F-gases through planning and consenting levers. To do so, the risks and barriers outlined above would need to be overcome, and funding would need to be provided to subsidise the use of alternative gases.
Promotion of take-back scheme	CoolSafe operates a take-back scheme that promotes the correct disposal of F-gases. Promotion of the scheme by Canterbury councils could encourage safer disposal.
End of life	Proper recovery, reclamation, and recycling of refrigerants at the end of their lifecycle can prevent emissions. This involves reclaiming used refrigerants and reusing them in new systems. The Government is currently developing a Refrigerants Regulated Product Stewardship (RRPS) scheme[489], which will provide for mandatory participation in an accredited scheme to collect and destroy synthetic refrigerants. Councils can take steps to understand the scheme and how they can support suppliers, installers and disposal sites once implemented. This may include anything from promoting the scheme and sharing information, through to considering developing or co-developing with industry a waste handling facility like the Kawerau F-Gas Destruction Facility.

[489] Minister for the Environment (2024): Reducing the environmental impact of synthetic refrigerants | Beehive.govt.nz

Cross-sector and system changes and interventions

This section summarises the links across each of the sectors. This is based on the information on the barriers, risks, opportunities and council intervention options of the sectors reviewed. It covers:

- examples of opportunities that can assist multiple sector low emissions transitions
- a selection of some of the common themes or initiatives for intervention that need to be developed to support all sectors to transition to a low emissions future.

Electrification and improved management of methane are two key cross-sector interventions that can enable a low emissions transition:

Cross-sector intervention	Description
Electrification and renewable energy	Further electrification of the grid and development of grid capacity for increased power will: • reduce emissions at source • allow for industries to divest from fossil fuel heating, like that required for meat and dairy manufacturing • stimulate an increase in personal electric vehicle uptake • enable greater uptake of distributed energy generation • enable bus electric fleet uptake through the capacity to provide high-capacity charging infrastructure • enable increased uptake of light and heavy EV vehicles for freight • introduction of future technologies including the advancements in clean hydrogen production or carbon capture and storage. • support waste facilities, construction projects, commercial buildings to reduce their scope 1 & 2 emissions. To support electrification, Canterbury councils could provide some of the investment for various infrastructure changes and work with energy suppliers to develop grid capacity. Including this investment as part of a regional deal with the Government could be considered, and could include co-investment with industry and central government. Increasing availability and uptake of other renewable energy options, such as biomass and biogas, is a further opportunity alongside electrification. Councils also have a role in ensuring energy users are well-informed about sustainable choices and switching to renewable energy and electricity instead of fossil fuel dependent equipment.

Management of methane	In addition to reducing methane emissions at source, the quantity of methane produced in the region could be better captured to produce energy. Potential direct energy application (through burning) include: • landfill sites adopting methane capture technologies for energy recovery. • anaerobic digesters to collect and process organic waste, which would also reduce methane at landfills – so an understanding of transition impacts is needed across the waste sector. • agricultural systems could also capture methane from manure in slurry pits. Alternatively, methane could be captured and processed for: • biogas to be used as bioLPG or industrial activities, • biofuels in vehicles or home energy and heating, or • creation of hydrogen fuels. Canterbury councils would need to work with waste facilities and the manufacturing and pastoral sector to understand the potential for technology adoption, and then work identify appropriate funding or financing schemes. Ensuring that consenting processes are efficient and applicants are well-prepared would also support applicants through the consent process.

Set out below is a selection of some of the common opportunities/initiatives for intervention that need to be developed to support all sectors to transition to a low emissions future:

Initiative	Description
Data	The agriculture and waste sectors have accuracy issues with current emissions data. Councils can support improvements by developing effective data management collection and handling processes. Through this, baselines, benchmarks and progress can be established and tracked.
Improved collaboration with central government	Across every sector there are keystone pieces of legislation and policies that will establish the controls for a low-emissions transition, such as National Environmental Standards, the Building Act and Codes, and policy on agricultural emissions pricing. Without good relationships with policy makers, it is difficult for industry and councils to plan for change effectively. By working together as a voice for the region, local government can influence policy settings and ensure these are delivered in a just and inclusive way for Canterbury's communities.
Technology	Councils need to ensure that they keep up to speed with the types of technologies that will deliver low emission transitions across the sectors. Building greater connections with universities, Crown research institutes and industry is paramount, as is

	considering how local government can incentivise global investment in establishing national and regional markets for new tool and technology. Economic Development Agencies across the region may an important role to play in this. Ensuring consenting processes enable the adoption of low-emissions technology will also be key.
Access to finance	Access to financial support is important for industry, tertiary institutes and Crown research organisations to undertake research and development, invest in technology, develop infrastructure, educate, develop or employ skilled labour, and submit acceptable consent applications. Canterbury councils can restructure investment priorities, develop income streams and engage with private investors (domestic and international) to facilitate the economic packages needed for the transition. Consideration of public-private partnerships, ratepayer assistance schemes, climate levies, taking advantage of Local Government Funding Agency finance, and seeking funds or finance from overseas investors all need to be considered. Councils can also take a proactive approach to promote the availability of funding and financing opportunities that already exist from public and private sources. More on funding and financing is provided later in this Overview.
Information-sharing	Communities and businesses should be supplied with sufficient information to empower them to make sustainable choices. What and how information should be provided may differ depending on the audience and sector. Regardless, councils can work collaboratively to ensure information is consistent across the region and provides easy wayfinding to local, regional and national support. Access to funding, research and solutions is key information, as is highlighting successes, exemplar developments or initiatives
Skills	Central and local government recognise the requirement for a productive labour market to support a low emissions transition across all sectors. The technology and operational changes required will need to be supported by skilled labour developed within New Zealand or attracted to work and live in Canterbury. Canterbury councils could jointly develop with the private sector a low-emissions skills map and plan to help understand the step changes needed.
Circular economy	A circular economy approach to waste, materials and resources is key to resolving waste emissions and help stimulate changes in industry and behaviour change around consumption choices and disposal activities. A circular economy can promote new industries, providing employment and skills opportunities. Councils, through the Canterbury Waste Joint Committee, should work together to map opportunities and promote a circular economy across the region.
Regulatory processes	Changes to the consenting processes can help to reduce barriers to adopting low emission solutions. Councils could consider how to improve effective pre-application support, and investigate developing lists of pre-approved and priority technologies. Spatial planning frameworks should encourage and enable sustainable living.

Through these opportunities and interventions, some of the impacts on reducing emissions could be:

Sector	Impact
Agriculture	The options for intervention concentrate on the reduction of methane gases. A roadmap against the intervention actions to combat the 'four interventions' of rumen emissions should help to reduce them in line with central government targets. In addition to local authority support for methane gas reduction, farming systems should see a greater stewardship for the environment and a well informed and skilled labour market. Access to funding streams to encourage the adoption of low emissions technologies can brace the industry through change and encourage economic prosperity. Failure to manage agricultural emissions could lead to the opposite of the above impacting the sector's ability to meet emission reduction targets set by central government.
Waste	A circular economy for waste impacts all sectors, enabling social, economic, cultural and environmental value to be achieved. Intervention by Canterbury's councils would support, educate and motivate change among sectors, so that the value of waste and resources are recovered, reducing greenhouse gas emissions. Through the introduction of energy from waste technologies, creation of refurbish / reuse / recycling businesses, there are co-benefits that include helping to stimulate jobs, generate lower emissions for energy, and grow local economies. Investment in waste facilities with new technology increases the options for waste treatment, improving compliance with the waste hierarchy.
Stationary energy	The New Zealand electricity sector will require more than NZD$50 billion spent on electricity infrastructure by 2035[490]. Shifting the manufacturing industries reliance on coal and supporting use of electric heating/cooling for households supports greenhouse gas emission reductions and stimulates greater energy security. The local economy will grow to support the change and improve regional productivity. Public engagement opportunities should improve relationships between local government, communities and commercial entities. Options for streamlining the information provided for technologies and energy efficiency equipment and behaviours should improve adoption of low emissions measures across energy generation, distribution and use.

[490] International Energy Agency (2024): Clean energy is boosting economic growth – Analysis - IEA

Transport	With less financial support coming from central government for transport in Canterbury, there's likely to be more public private partnerships being established. Regional mobility will include a decarbonised bus fleet with increased patronage as people incorporate more reliable, frequent and safer public transport. Through increased use of electric vehicles there should be a greater supply of vehicle charging stations, which will help reliable connection of communities across the region. Moving more freight onto rail or coastal shipping will reduce road congestion, and with the heavy vehicle fleet transitioning to lower emission alternatives, this will also contribute to better health outcomes. Fewer fossil fuel vehicles on the road, whether light or heavy vehicles, will improve health through reduced air and noise pollution.
Industrial process and product use	Mechanisms are already at play to reduce the impacts of F-gases through policy and regulatory intervention. Local government intervention can stimulate an industry to manage F-gases over their life cycle, supporting the supply of refrigerant gas alternatives, or detection of leaks. The promotion of a circular economy for the disposal of F-gases will help reduce emissions and develop new economic markets for recovery industries.

7 Funding and financing the transition to a low-emissions future: Options for Canterbury's local governments

Background and context

As has been well-traversed in New Zealand over the years, significant investment is needed if New Zealand is to sufficiently reduce greenhouse gas emissions and meet its climate goals. Financing and funding GHG emissions reduction is complex and requires both public and private investment. Effective funding and financing structures that enable city, district and regional government in Canterbury to respond to evolving climate-related challenges and opportunities will be critical to achieving the aspirations of the low-emissions transition strategy and the wider Canterbury Climate Partnership Plan.

This chapter describes and assesses some high-level options for consideration to help fund or finance climate mitigation initiatives. It will form part of the consideration for developing actions for the low-emissions transition plan.

Current state – funding or financing climate mitigation actions across Canterbury's local government

Councils in Canterbury are all at different stages in funding and financing climate mitigation and/or adaptation initiatives, with some in the process of implementing climate plans or strategies while others are developing their climate actions. As summarised below, most actions are currently funded by rates or borrowing.

Canterbury councils are showing leadership in climate mitigation by completing carbon footprint assessments for their own activities, which have identified areas where councils can actively reduce emissions. For example, some councils have or are in the process of reducing fuel usage in their vehicle fleets, or upgrading these vehicle fleets to electric vehicles or hybrids[491], while others are taking opportunities to ensure new buildings or infrastructure use renewable energy sources[492]. In

[491] See, for example, https://www.ashburtondc.govt.nz/__data/assets/pdf_file/0016/56041/20913-Climate-Resilience-Plan.pdf , https://www.timaru.govt.nz/__data/assets/pdf_file/0011/866423/Climate-Change-Response-Policy-.pdf, and https://www.ecan.govt.nz/get-involved/news-and-events/2024/celebrating-the-acceleration-into-an-electric-bus-future/.

[492] For example, Hurunui's new council building in Amberley has rooftop solar panels - https://www.hurunui.govt.nz/environment/climate-change, and in Selwyn solar panels and innovative cladding provide up to 80% of power use in summer at the Selwyn Sports Centre - https://www.selwyn.govt.nz/community/our-natural-environment/climate-change

urban areas, public transport and increased walking and cycling options have also been progressed[493].

Environment Canterbury also subsidises replacements of high-emissions old burners with cleaner heating options (low-emissions burners or heat pumps) for low-income households[494]. This is funded through an Air Quality Heating Assistance targeted rate[495].

Councils also fund emissions mitigation through how they manage household waste – whether through collecting compostable waste separately to general waste, education and awareness campaigns on reducing waste, or turning organic matter into biogas[496].

As referenced earlier, councils' Te Tiriti o Waitangi partner Te Rūnanga o Ngāi Tahu recognises reducing greenhouse gas emissions as a key tenet of its climate change strategy. Te Rūnanga has focused its efforts on measuring and auditing its own greenhouse gas emissions annually since 2016, investing in electric jet boat development and methane-reducing farm technology and practices, phasing out diesel and petrol fleet vehicles, and monitoring its key vendors' emissions reductions through regular vendor reporting[497].

Beyond Canterbury, other councils are employing various options to fund or finance climate mitigation. For example, the Greater Wellington Regional Council operates a Low Carbon Acceleration Fund for projects that reduce Greater Wellington's organisational GHG emissions. The fund is funded from borrowing against 70% of the value of ETS units that were gifted to it in 2012 for its pre-1990 forests[498]. While this solely funds initiatives relating to its own, rather than community or industry, emissions, the fund has so far put aside money for a large planting and wetland restoration programme, LED lighting replacements at the Wellington Regional Stadium, and a solar PV system for Masterton station[499]. All of these initiatives will contribute to emissions reduction in the region. In Auckland, a Climate Action Targeted Rate was introduced in the 2022/2023 year to specifically fund climate action[500]. The rate focuses on projects that will enable greater access to low-carbon public transport, well-connected walking and cycling options, and increased tree planting in parks and along streets, all of which will support a reduction in greenhouse gas emissions.

The above demonstrates that local government is taking action to reduce its greenhouse gas emissions. However, these initiatives are largely focused on reducing organisational emissions, rather than industry and community commissions, and are mostly funded through rates (with notable exceptions for co-funding from Waka Kotahi for some public-transport related initiatives, and Greater Wellington's initiative through borrowing against ETS unit values).

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[493] For example, flexible public transport in Timaru - MyWay by Metro | Metro Timaru, cycleways in Christchurch City - Cycleways : Christchurch City Council, improved frequency of key bus routes in Greater Christchurch - Transforming public transport | Environment Canterbury, and safer streets for pedestrians in Christchurch - Way safer streets : Christchurch City Council.

[494] See Financial assistance and temporary waivers | Environment Canterbury

[495] See How your rates are spent | Environment Canterbury

[496] For example, Waste actions to lower emissions : Christchurch City Council

[497] See Greenhouse gas emissions | Te Rūnanga o Ngāi Tahu

[498] See Greater Wellington Regional Council: https://www.gw.govt.nz/environment/climate-change/what-we-are-doing/corporate-carbon-neutral-plan/

[499] See Greater Wellington Regional Council: Climate-Committee-12-September-2024-Order-Paper.pdf

[500] See Auckland Council: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/environment-cultural-heritage/Pages/climate-change.aspx

The next section looks at barriers and opportunities for councils to invest in greater emissions reductions work. Following that, currently available options for councils are outlined and assessed, as well as information on potential options that may be available in the years ahead.

Investing in climate actions – barriers and opportunities

There are a range of barriers and constraints that impact the ability or willingness to invest in climate mitigation initiatives generally. Some of the key barriers identified include:

- lack of data and evidence about climate risks and opportunities
- high upfront costs
- timeframes for developing emissions reduction technologies, building infrastructure and completing environmental projects
- policy uncertainty
- regulatory barriers[501].

In addition, understanding of the funding or financing options available and how to access them can vary across sectors and industries. Lack of capacity and time to prepare bids to funds (that may not be successful) or to establish commercial arrangements to access financing can also be a barrier, as can a lack of data or evidence (e.g., whole of life costs and benefits) to develop a clear and compelling value case to attract investment.

For local government particularly, access to capital (both volume and timing) is also a significant barrier given current funding and financing structures[502]. These structures mean that rates (general or targeted) remain the key source of income for councils. While councils can access finance via the Local Government Funding Agency[503], this is constrained by debt covenants and therefore differs between each council. Rates affordability remains front of mind for all councils and can be a major barrier to investing in climate action.

In addition, a lack of co-funding options from central government remains an issue for local government. Limitations on local government powers to access new sources of funding (e.g. an inability to establish regional fuel taxes or congestion charges that could be used to fund low-emission transport solutions) can have a significant impact on the initiatives local government could pursue. In fact, the second Emissions Reduction Plan makes no mention of local government being involved in emission reductions at all. The Plan focuses solely on unlocking private investment in climate action, and therefore does not provide any clear co-funding opportunities for local government to access. Previous co-funding options, such as the Climate Emergency Response Fund and Waka Kotahi's Transport Choices programme, have been discontinued. The Waste Minimisation Fund continues to exist, but supports projects wider than emissions reduction[504]. Further, many

[501]Ministry for the Environment (2024): New-Zealands-second-emissions-reduction-plan-202630.pdf
[502] KPMG. 2023. *Environment Canterbury: Funding and Financing for Climate Action*. Report prepared for Environment Canterbury staff.
[503] LGFA: Providing diversified funding sources for NZ local authorities | New Zealand Local Government Funding Agency
[504] Ministry for the Environment: Waste Minimisation Fund | Ministry for the Environment

government funds that are available do not support actions taken by local government, but rather exist to support innovation / research, business or communities.

Lack of data and evidence about climate risks and opportunities can also be a barrier for local government. While this is not so much the case any more for Canterbury, having completed the regional Climate Change Risk Assessment in 2022 and the greenhouse gas inventory in 2024, it does affect other regions in proximity to Canterbury and could hamper collaboration options.

For context and comparison, while the private sector is not constrained by how it makes its income in the same way that local government is, its barriers to investing in climate mitigation actions relate more to those identified in the list above. The second Emissions Reduction Plan notes particularly that businesses need greater policy certainty to increase investment, and that there is an ongoing mismatch between some climate investment opportunities and the risk appetite of many mainstream investors[505]. Some opportunities to provide for increased investment in emissions reduction that were identified by the private sector during consultation on the second Plan included improving investor confidence in green investments by reducing real or perceived risks (such as supporting improved data and evidence, further transparency, market integrity via guidance and monitoring, capability building and technical assistance), developing sector-based transition pathways by identifying and addressing barriers facing specific sectors, and exploring interventions that can mobilise additional private investment[506].

Options

Set out below is an assessment of the currently available funding and financing options local government can access to invest in climate action.

[505] Ministry for the Environment (2024): New-Zealands-second-emissions-reduction-plan-202630.pdf
[506] Ibid, p28.

Table 1: Funding or financing streams from local government sources or channels:

Option type	Description	Examples	Advantages/disadvantages
Property taxes/rates	General rates collected annually, based on property values	Council general rates as charged by each council on rateable properties	Using general rates for this purpose is straightforward, familiar and certain; but would likely require rate rises which impact low or fixed-income groups the most, or cuts to other services which could impact a range of communities.
Targeted climate rates/levies	Rates collected separate to general rates for a specific purpose (levied through all ratepayers, exacerbator-pays or beneficiary-pays)	Auckland Climate Action Targeted Rate[507], Selwyn District flood and river resilience targeted rate[508]	Equitable approach as it creates new source of funding paid for by those that benefit, and ensures that the funding is ringfenced for a specific purpose.
Development contributions	Charges applied to new properties to cover costs relating to new/upgraded infrastructure to service growth	Christchurch City Council's Development Contributions Policy[509]	Those who benefit pay the charges. These can also be used to help influence low-carbon behaviours while paying for low-carbon solutions. However, development contributions cover a limited number of actions, relate to new developments only, and can only be charged by district and city councils. Further, development contributions can only be used for cost recovery.
Creation of CCO or joint council partnership	Regional CCO or partnership to fund and execute climate actions.	Wellington Water shared service CCO[510]	This approach encourages regional collaboration and participation, and ringfences funds for agreed actions and initiatives. The key benefits of a CCO are the expected dividends that result from its work and the ability to influence its priorities through letters of expectations. There are costs and administrative burdens involved in setting up and running a CCO/partnership however, and arrangements can be time-consuming to establish and complex depending on the number and nature of the parties involved.

[507] See Annual Budget Focus: The Climate Action Targeted Rate explained - OurAuckland
[508] See Selwyn District river resilience work | Environment Canterbury
[509] See Development Contributions Policy : Christchurch City Council
[510] See Wellington Water Committee

Local Government Funding Agency GSS or CAL loan	Finances climate actions for local government at a lower debt cost than any other lending institution borrowing. The Green, Social and Sustainable Loans provide project-specific low-cost financing, and the Climate Action Loan can be applied across all council borrowing	Loans obtained by Wellington Regional Council[511]	Key benefit for councils is being able to access the lowest debt costs to finance actions or initiatives. The LGFA is an already-established, accessible and flexible finance option. However, loans are subject to a range of criteria (for CAL loans for example, councils would need to meet strict criteria, including having an 'assured' emissions inventory and a comprehensive organisational emissions reduction plan). GSS loans are also subject to debt headroom requirements, which differ among councils.
Private-public partnerships	Procurement model that includes a mix of public and private organisations/agencies jointly delivering a project.	Kate Valley landfill[512]	Useful for large and long-term projects with limited number of parties. Commercial return is required for private sector partner. This may limit the types of climate mitigation projects that could garner interest from the private sector.
Carbon credits	Selling NZUs or borrowing against their value to reinvest in climate mitigation or carbon removals activity	Greater Wellington Regional Council's Low Carbon Acceleration Fund[513]	There is an already-existing established market for carbon credits, and NZ forestry credits are highly regarded currently. Selling NZUs provides short-term funds that could be used for emissions reductions, while borrowing against the value provides an opportunity to finance initiatives. Borrowing against their value is an innovative approach to financing mitigation or removal options. However, this is not an option available to all councils. Further, borrowing against NZU values would also be a novel approach for many, and a move away from established financing approaches. Income could be uncertain, as could the carbon price and long-term stability given the ETS is presently subject to the view of the government of the day. Selling NZUs also comes with risks. Using the value of NZUs (through either selling units or borrowing against them) could also take some time due to the complexities involved with

[511] See Greater Wellington Regional Council approved for Climate Action Loans (CALs) | New Zealand Local Government Funding Agency
[512] See About Us - Transwaste
[513] Greater Wellington Regional Council: Greater Wellington — Greater Wellington on the pathway to lower carbon emissions

			council ETS policies, which could hamper the usefulness of this option in the short or medium term. In addition, obligations around supplying carbon credits (3rd party verification) and obligations around losses (e.g. should a fire occur) would apply regardless of whether NZUs are sold or borrowed against.
Asset sales	Selling council-owned assets to generate income for climate actions	Christchurch Capital Endowment Fund[514]	Selling an asset can generate income to fund climate projects – actions can be funded from the capital received from the asset, or the interest if the income is re-invested. Asset sales are challenging politically and have other opportunity costs such as lost future income to fund other projects. This option is also not possible for all councils.
Revenue from investments	Use of dividends from CCOs or other investments for funding or contributing to climate mitigation actions	Returns to Christchurch City Council from Christchurch City Holdings Limited[515]	This option does not increase rates for residents. However, not all councils have this as an option, and income from investments can be uncertain or variable and therefore this approach could have limited reliability as a medium or long term funding option. Investment income is often already earmarked for other things, so could require reprioritisation within councils to ringfence the income for climate work.

[514] Christchurch City Council: Capital-Endowment-Fund-Draft-LTP-2024-34.pdf
[515] Christchurch City Holdings Limited: Home | CCHL

Table 2: Funding or financing streams from central government channels or sources:

Option	Description	Examples	Assessment
Infrastructure Funding and Financing Act mechanisms	Legislation provides funding and financing mechanism that enables high leverage to be raised for infrastructure initiatives. Project debt is repaid over the long-term through a local levy on ratepayers	Tauranga Transport System Plan[516]	Available only for infrastructure-related projects, and legislation is subject to review by the current Government. Provides an off-balance-sheet option, and is not included in LGFA covenants. Project beneficiaries pay for the upfront costs, however still increases costs for ratepayers in the long run. Suitable for larger infrastructure projects as the mechanism is highly complex.
Research and innovation-related grants and partnerships	Research and innovation grants from public sector agencies and partnerships with CRIs and universities	MBIE science and innovation funds, Callaghan innovation[517]	These provide access to range of funding (and partnership) opportunities with MBIE, Callaghan Innovation, universities and CRIs. With many CRIs based in Canterbury (Lincoln) there are good opportunities to build connections and collaborate on climate issues of mutual interest. However grant applications must fit the fund's criteria and are usually highly competitive. Applications are resource-intensive, as are reporting and compliance responsibilities if a grant is awarded.
Central government partnership-based funding contributions or grants	Support or contributions to initiatives from Government departments or agencies	NZTA transport funding, EECA funding of energy efficient technologies, DoC nature funds, MFE Waste Minimisation Fund, Flood Protection co-investment in Canterbury[518]	Opportunities to build enduring relationships with government departments/agencies, including NZTA, EECA, MBIE, MfE, DoC and access a range of funding or part-funding for initiatives and projects. Provides strategic opportunity to highlight the region's priority climate projects with government. As above, grant applications must fit the fund's criteria and are usually highly competitive. Further, in some instances grants will cover only a portion of the funds needed for a project's delivery.

[516] Ministry of Housing and Urban Development: The Infrastructure Funding and Financing (Western Bay of Plenty Transport System Plan Levy) Order 2022 - Te Tūāpapa Kura Kāinga - Ministry of Housing and Urban Development

[517] See Funding information and opportunities | Ministry of Business, Innovation & Employment; Home | Callaghan Innovation

[518] See: NZTA transport funding, EECA funding of energy efficient technologies, DOC nature funds, MFE Waste Minimisation Fund, Flood Protection co-investment in Canterbury.

Regional Infrastructure Fund	Managed by Kānoa. Funding support is primarily provided through a mix of loan and equity investments. The Fund invests specifically in regional infrastructure, focusing on projects that boost regional growth, resilience, and productivity	Flood resilience projects in the Nelson region[519]	Not emissions reduction-specific, but resilience could cover energy efficiency (electrification), transport, and other transition-related initiatives. Probably more aligned with adaptation initiatives than emissions reductions. Projects applying for funding must align with regional priorities, set by the Mayoral Forum, which are energy, transport/planning, housing, public infrastructure, water, people, and food. Christchurch City is excluded from applications, so the fund would not cover any initiative that includes that part of the region.
NZ Green Investment Finance (NZGIF) loan	Crown-owned green investment bank seeking to support a low-carbon future for New Zealand	NZGIF investment in EV fleet for NZ Post[520]	Finance is specific to supporting a low-carbon future. The NZGIF has significant finance available, from debt to equity, with the ability to take risk positions that help attract co-investors. As a commercial entity however it only invests in projects, companies or technologies that are commercial-ready, and a return is a requirement, meaning it may be more suitable for the private sector. Despite this, a notable SOE initiative it has invested in is an EV fleet for NZ Post.
Māori Climate Platform Initiative	Government initiative through Emissions Reduction Plam. Will focus on targeted support and funding to invest in Māori-led climate action in key areas such as resilience, renewable energy, sustainable land use and nature-based solutions.	Referenced in Emissions Reduction Plan[521]	Detailed information on the initiative is not yet available. Depending on details about the platform and when and how it might be accessed, it may provide councils new opportunities to partner with mana whenua on initiatives and projects.

[519] For example: First Regional Infrastructure Fund co-investments confirmed | Grow Regions
[520] NZ Post: NZ Post :: NZ Green Investment Finance
[521] Ministry for the Environment (2024): New-Zealands-second-emissions-reduction-plan-202630.pdf

Table 3: Funding or financing streams from private sector channels or sources:

Option	Description	Examples	Assessment
NGO and philanthropic investment (including crowd sourcing)	Funding from organisations and foundations that seek sustainable environmental outcomes	Rata Foundation, Tindall Foundation, The Christchurch Foundation[522]	Funding from these sources is available to councils and is wide-ranging. However, it is competitive, and funding bids must align with specific criteria.
Green bank loans or bonds	Lower-cost "green loan" borrowing or bonds from banks	Auckland Council bond issue[523]	Borrowing is on a shorter term than LGFA loans and must meet strict criteria. More expensive than LGFA finance and comes with additional reporting obligations.
International funds/programmes	Funding through international climate action programmes	Horizon Europe fund[524]	Opportunities to build international connections, collaborations and partnerships. Despite this, these can be hard to access. Councils would also need to be invited into a consortium by a partner, which relies on good relationships with European countries
BlackRock Investments Climate Infrastructure Fund	Co-investment from third party organisation seeking to support sustainable outcomes in New Zealand	No projects have yet received investments from the fund.	Fund is specific to New Zealand. Projects/initiatives require a commercial return to be considered for funding. Concerns around ongoing availability of NZ fund following decision to pull out of SolarZero in 2024

[522] Rātā Foundation: Rātā Foundation I Homepage | Rātā Foundation; Home - The Tindall Foundation; Home | Christchurch Foundation
[523] Auckland Council: Green Bonds
[524] Horizon Europe: Horizon Europe - European Commission

FINANCING AND FUNDING BUSINESS AND COMMUNITY INVESTMENT IN CLIMATE ACTION

For context, the above private sector sources can also be used by businesses to fund their climate action outside of their own income, and there are opportunities for the private sector to collaborate with local government on PPPs and co-funding projects of mutual benefit.

Funding available through EECA, the Regional Infrastructure Fund and finance through NZGIF can also offer significant opportunities. EECA, for example, has a range of co-funding opportunities for businesses and specific funds for large energy users, including a technology demonstration fund, low emissions heavy vehicle fund, funding for feasibility studies or business cases, and funding for energy opportunities assessments[525].

For community groups, some other funding is also available, such as Meridian Energy's Community Decarbonisation Fund[526]. Government entities (central government, local government, and schools) are not eligible for this fund. Community groups can also access a range of funds from local government for environmental projects, which may include emissions reduction initiatives; for example, Selwyn District Council's the Selwyn Natural Environment Fund[527], and the Christchurch City Council's Sustainability Fund[528].

POSSIBLE FUTURE OPTIONS

Local Government New Zealand is currently engaging with the Government on the range of local government funding and financing tools it has identified that would reduce ratepayer burden.

The tools they have identified are classed into three categories; tools currently on the Government's agenda; tools that LGNZ understands the Government is interested in; and tools councils want but are not of interest to the Government. Of those tools currently on the Government's agenda, ones that could be relevant for funding and financing climate mitigation are:

- congestion charging – allows those who don't want to pay to use particular roads to benefit from more funding being available for other transport options such as buses, cycling or walking. A bill is currently before Parliament to enable this for councils
- the regional infrastructure fund (as noted earlier)
- regional deals – emissions reduction could be a byproduct or co-benefit of resilient infrastructure included in a deal in the Canterbury region
- reform to the Funding and Financing Act (as noted earlier) to provide for off-balance sheet financing for councils to provide infrastructure.

Although few of these relate directly to emissions reduction, removing pressure off rates would be a by-product of most, meaning that more funding and financing may be available for mitigation initiatives, particularly in relation to transport.

[525] EECA: https://www.eeca.govt.nz/co-funding-and-support/
[526] Meridian Energy: Community Decarbonisation Fund | Meridian Energy
[527] Selwyn District Council: Selwyn District Council - Selwyn Natural Environment Fund
[528] Christchurch City Council: Sustainability Fund : Christchurch City Council. Schools and businesses can also apply to this fund.

Considerations when developing actions for the transition plan

Based on the information above, below are some considerations to be taken into account from a financing and funding perspective when developing actions for the transition plan:

1. Local government can access a range of funding and financing opportunities for emissions reduction-related infrastructure initiatives. This could include transport mode shift initiatives (e.g. cycleways, bus lanes, mass rapid transit) and energy infrastructure (e.g. solar panel-related initiatives, EV charging infrastructure). Key options for consideration are:
    - **LGFA Green, Social and Sustainable and Climate Action loans**
    - **Regional Infrastructure Fund (outside of Christchurch City)**
    - **NZGIF for projects that could make a commercial return**
    - **Regional deals.**
2. Funding and financing options for non-infrastructure projects are more limited. Key options to consider include:
    - implementing a **climate levy/targeted rate** across the region as part of 2027 LTPs to fund regionally-agreed projects and initiatives. The funds could be pooled and managed by either the Canterbury Mayoral Forum or a regional CCO. This fund could support council initiatives, business emissions reduction actions, and community emissions reduction aspirations alongside already available funding from other sources
    - further investigating the opportunity to **monetise or borrow against carbon credits** from NZUs and using these to support mitigation initiatives; noting however this is not an option for all councils, has risks attached to it, and could take some time to set up
    - **LGFA loans** to support projects relating to low-emissions, energy efficient homes and buildings, supporting innovation and sustainable production in the primary industries and afforestation, and transport mode shift
3. While there are limited funding options available from central government, **aligning initiatives with government policy** is a key opportunity. At present, this includes:
    - partnering with the government on **afforestation and carbon sink opportunities**
    - making greater use of the **Waste Minimisation Fund.**

    There may be future opportunities available through under-consideration initiatives by the Government such as allowing local government to implement congestion charging schemes and through changes to the Funding and Financing Act.
4. There are opportunities to **connect better with universities, CRIs and government agencies** (specifically MBIE, MPI and EECA) to co-invest in research to support emissions reductions across sectors, particularly agriculture
5. To take advantage of international funding opportunities, councils could register with **Horizon Europe**. Currently the Christchurch City Council is the only Canterbury-based council on the participant register
6. Supporting mana whenua to access the **Māori Climate Platform Initiative** (once more details on this initiative are known). This may be through co-investment or co-funding
7. Supporting greater investment in climate action more widely through ensuring councils have an **enabling planning and consenting frameworks** to support private sector infrastructure initiatives.

8 Conclusion

The Strategic Overview has provided an outline of emissions reduction initiatives and key actors in the region, the international influences impacting the speed and nature of the low-emissions transition in New Zealand, and has identified a range of opportunities to consider pursuing in the next stage of the transition plan project, alongside barriers and risks. In doing so, it has confirmed that there are a significant number of initiatives occurring in the region already to reduce emissions across each sector, and has highlighted where there may be gaps. It has also confirmed where many opportunities lie for Canterbury to transition to a low-emissions future, and that these opportunities are often connected, have multiple stakeholders, and have linked co-benefits.

Additional transition opportunities may arise as other Partnership Plan projects progress this year. Similarly, further opportunities could be identified as Environment Canterbury develops its integrated regional plan. This will tie in with reforms to resource management legislation being progressed by the Government in 2025.

Next steps

The opportunities identified in this Overview will undergo a deeper assessment in the next phase of the project, which will include an analysis of their impacts across the four wellbeings (environmental, economic, social and cultural). This will assist in determining the opportunities that may then be appropriate to flow through to actions in the transition plan.

To ensure an equity lens is applied in the next phase of the project, there will be a focus on the impacts on traditionally underserved communities in the region, with a particular focus on iwi/Māori, rural and remote communities, and low-income communities.

An equitable and inclusive transition

Prosperity

Emissions reduction

Climate action leadership

It's time, Canterbury
Our climate change conversation

CANTERBURY
Mayoral Forum

PU1C/8989