Tonkin+Taylor

Final report

Assessing the impacts of emissions reduction risks and opportunities in Waitaha Canterbury

Prepared for: Canterbury Regional Council
Prepared by: Tonkin & Taylor Ltd
Job Number: 1099243.0000
Date: 26 September 2025

www.tonkintaylor.co.nz

Authors:

Simon Harvey

Tessa Allan

Approved by:
Peter Cochrane

Job Number
1099243.0000

Version 4.0

Tonkin & Taylor Ltd

Tonkin+Taylor

Document control and review

Title: Final report - Assessing the impacts of emissions reduction risks and opportunities in Waitaha Canterbury					
Date	Version	Description	Prepared by	Reviewed by	Authorised by
08/09/25	1	Draft final report	Simon Harvey	Peter Cochrane	Peter Cochrane
12/09/25	2	2nd draft final report after client feedback	Simon Harvey	Simon Harvey	Peter Cochrane
24/09/25	3	Final report to confirm changes with client	Simon Harvey	Simon Harvey	Peter Cochrane
26/09/25	4.0	Final report	Simon Harvey	Peter Cochrane	Peter Cochrane

Table of contents

1 Introduction 1
1.1 Context 1
1.2 Purpose 1
1.3 This report 2

2 Assessment approach 2
2.1 Clarifying options to assess 2
2.2 Assessment methodology 8
2.2.1 Review with subject matter experts 8
2.3 Assessment challenges and limitations 9

3 Outcomes and findings 10
3.1 Outcomes 10
3.2 Findings 11
3.2.1 Highest overall wellbeing score 12
3.2.2 High emissions reduction potential / High council influence / Overall wellbeing score 15
3.2.3 High emissions reduction potential / Low council influence / Overall wellbeing score 17
3.2.4 High emissions reduction potential / High positive equity impact / Overall wellbeing score 20
3.2.5 High emissions reduction potential / High positive economic impact / Overall wellbeing score 23
3.2.6 High emissions reduction potential / Short-term emissions reduction impact / Overall wellbeing score 26

4 Summary of insights from the assessment 28
4.1 Insights 28
4.2 Enablers 29

5 Recommendations 31
5.1 Clarify opportunities 31
5.2 Fill identified gaps 32
5.3 Position the emissions reduction assessment 32
5.4 Use the assessment as a platform for engagement 32

6 Applicability 33

Appendix A Source documents used for assessment

Appendix B **Prompts used for the GPT assessment model**
Appendix C **Full list of options in order of wellbeing assessment scores**
Appendix D **Full list of options in order of scale of potential GHG reduction**
Appendix E **Enablers extracted from the Strategic Overview document**

Executive summary

This report presents the findings following a comprehensive assessment of 57 emissions reduction options for Waitaha Canterbury. The assessment applied a semi-quantitative framework across greenhouse gas (GHG) reduction potential and wellbeing outcomes (environmental, social, cultural, equity, and economic). To deliver breadth within a limited budget, the methodology used a customised AI GPT model alongside expert review, enabling analysis of a large number of options and criteria, using a consistent approach and broad evidence base.

A valuable output of the work is a practical decision-support tool. The assessment spreadsheet of results allows options to be filtered by GHG reduction potential, feasibility, adoption likelihood, lead time, time to impact, measurability, council influence, policy alignment, and all wellbeing domains. This enables flexible analysis to inform prioritisation, stakeholder engagement, and provide useful future input into Waitaha Canterbury's transition plan.

Main findings

- Six options scored highest overall for wellbeing outcomes including improved public transport, native afforestation, two forms of community-based waste initiatives, farm advisory services and active travel in urban areas. They are all feasible in the short term, with most delivering medium-term emissions reductions, and councils hold strong influence over several of them.
- Options with both high emissions reduction potential and high council influence highlight the value of public transport improvements, landfill methane capture, and industrial heat transition. These carry trade-offs such as capital costs or environmental risks, requiring careful design.
- Where emissions potential is high, but council influence is limited (for example, freight mode shift, aviation fuels, hydrogen and agricultural technologies), progress will depend on central government, industry, and mana whenua partnerships, with councils acting as enablers and advocates. These options should be more carefully investigated as part of the stakeholder engagement phase of work. These options are also likely to benefit from careful design and choice of different enabling approaches to incentivise and support uptake by relevant stakeholders.
- Equity is the cornerstone of Action 2 in the Canterbury Climate Partnership Plan. Poorly designed initiatives could entrench disadvantage (for example, precision agriculture and EV infrastructure), while others can deliver significant gains in affordability, access, and inclusion (for example, public transport and energy efficiency). The assessment findings can help the careful design of initiatives that mitigate inequity and maximise broad wellbeing outcomes.
- The cultural wellbeing assessment primarily highlights impacts relating to Māori and mana whenua, with no material impacts arising from the options assessed for other specific cultural interests. These cultural impacts on Māori and mana whenua proved hard to assess. While many options align with kaitiakitanga and Te Ao Māori values, meaningful evaluation requires direct engagement with Rūnanga and mana whenua. The social and

equity wellbeing assessments include and highlight broader impacts relating to issues of inclusion and equity across the full range of social, socio-economic and ethnic groups.

- A comprehensive range of tangible urban form initiatives is yet to be developed in a form that could be included in this assessment. This is an important area of council influence. For example, compact, transit-oriented settlement design could lock in ongoing emission reductions while delivering broad wellbeing benefits. At this stage, urban form influence is captured as one of a number of a broader cross sector initiatives and enablers.
- A significant number of these broader cross sector initiatives and enablers (referred to collectively as *enablers*) have been identified. Whilst vitally important when considering the implementation design of emission reduction initiatives, these enablers are not yet articulated in sufficiently concrete or tangible terms to assess as part of this project. However, these enablers comprise various levers and areas where councils can strategically influence reductions in GHG emissions.

Implications for next steps

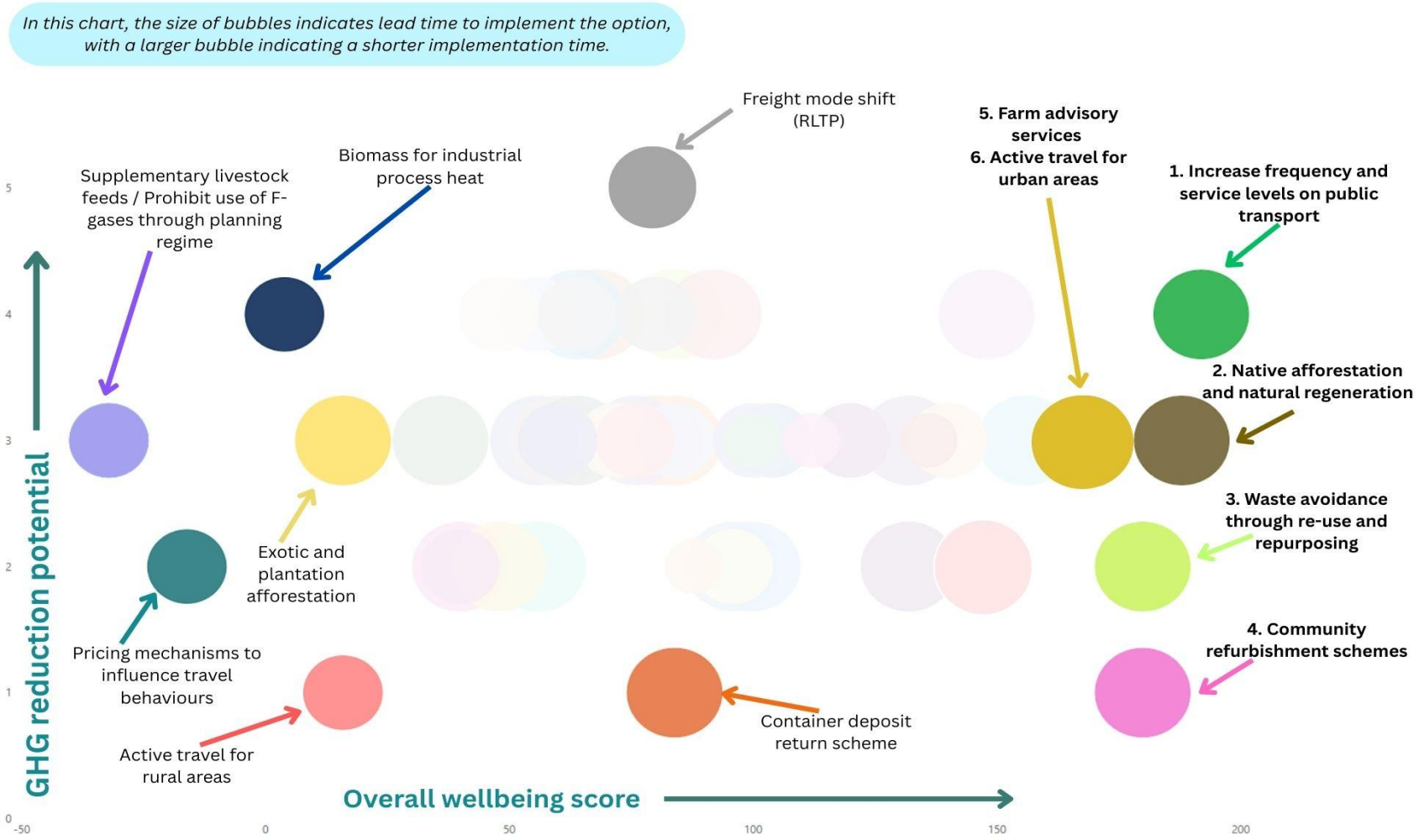
The assessment provides a structured, transparent evidence base for stakeholder engagement. It highlights where councils can lead, where partnerships are essential, and where delivery design will determine outcomes. The spreadsheet tool allows ongoing analysis, helping decision-makers compare and prioritise options under different criteria and weightings. The enablers will be an important component of the next phase of work to design actions for the regional emissions reduction transition plan; but their assessment falls outside the scope of this piece of work.

The next phase, stakeholder engagement, should focus on clarifying option scope, addressing identified gaps, embedding equity and cultural perspectives, and aligning options with enabling conditions. This will set the foundation for drafting concrete, implementable actions for inclusion in council long-term plans.

Summary graphic

The graphic below highlights the options which were ranked at the extreme ends of the assessment. Those on the right-hand side show the six highest ranking options for positive wellbeing impacts; the five on the left-hand side scored lowest for wellbeing impacts, with three having overall negative wellbeing scores. The options located towards the top of the chart are those assessed to have a higher emissions reduction potential; whilst those at the bottom were assessed as having lower emissions reduction potential. The size of the bubbles in this chart indicates the amount of time required to implement the option, with a larger bubble reflecting a shorter implementation time.

The bubbles that are lightly shaded and not labelled show the positions of all the other options assessed. A number of these are highlighted in section 3.2 of the report which explores outcomes and findings of the assessment.



Graphic showing all options and identifying those scoring highest and lowest for overall wellbeing and GHG emissions reduction potential. The higher the bubble, the greater the potential GHG reduction. Bubbles further to the right have higher overall wellbeing scores.

1 Introduction

1.1 Context

The overarching context for this project is a three-year emissions reduction programme of work that will result in a regional transition plan for Waitaha Canterbury. That work is being led by Canterbury Regional Council (Environment Canterbury) (**Canterbury Regional Council**) on behalf of the Mayoral Forum and the Canterbury Climate Change Working Group (**CCWG**). The Canterbury Climate Partnership Plan (**CCPP**) was approved by the Mayoral Forum in August 2024. The CCWG is made up of climate-focused staff from each of Canterbury's councils and is responsible for driving the actions in the CCPP forward.

Tonkin + Taylor Ltd (T+T) was retained by the regional council for this project acting on behalf of all councils in the Canterbury region, which are working together as partners under the Canterbury Mayoral Forum.

Action 2 of the CCPP is the focus of this project. Under CCPP Action 2, the partner councils agree *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*.

1.2 Purpose

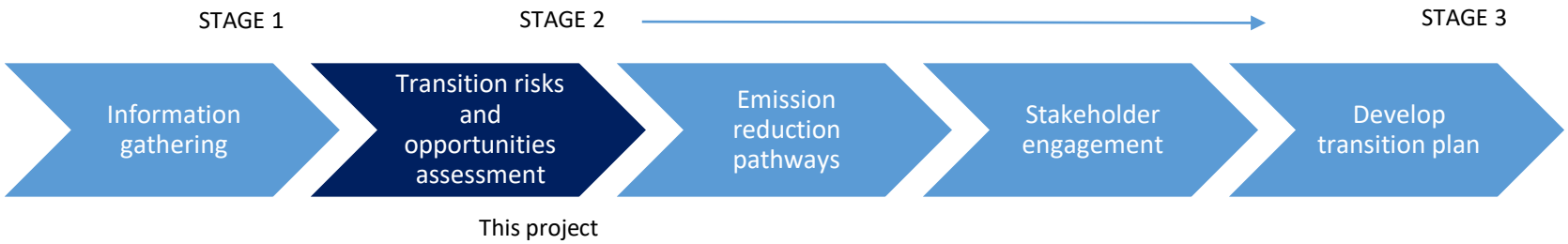
The main purpose of this project is to assess the social, cultural, environmental, equity and economic impacts (both positive and negative) of specific emissions reduction opportunities, or options, under consideration for Action 2 (**the options**). The specific aim of that assessment is to inform and enable communication about the potential impacts (or, risks and opportunities) of different options on people, businesses, and communities, if those options were implemented under Action 2.

The assessment is intended as an important input for stakeholder engagement sessions planned for October 2025. It will provide useful information for the development of a regional transition plan for Canterbury focused on decarbonisation goals. The assessment offers a supporting investment rationale for pursuing various different decarbonisation options by providing an assessment of risks and opportunities arising across the four wellbeings.

The initial list of options to be considered were presented in a detailed research report titled *Canterbury Climate Partnership Plan Action 2: Emissions Reduction - Strategic Overview* document (**Strategic Overview)**. This was part of the first stage of the regional transition plan work programme. In that document, the options were described as *opportunities*. We have chosen to use the word *options* to avoid confusion with the purpose of the project to assess *risks and opportunities.*

Whilst this project includes a high-level assessment of the decarbonisation potential of the emission reduction options, that aspect of the assessment is broad and indicative only. A more detailed analysis and assessment of decarbonisation options and emissions reduction planning has been commissioned as a separate piece of work for Canterbury Regional Council and is beyond the scope of this work.

The graphic below shows the three stages of the regional transition plan project and highlights where this project fits as the first part of the second stage.



1.3 This report

This report describes the approach and methodology adopted for the assessment and provides an overview of the findings and insights. More detailed findings of the assessment are set out comprehensively in a separate Excel spreadsheet (**assessment spreadsheet**) provided to Canterbury Regional Council as a separate document alongside this report, which presents a full range of specific information relating to the assessment of each option.

The assessment was undertaken using a semi-quantitative approach. This enables the detailed information and findings in the assessment spreadsheet to be reviewed and filtered by a range of different criteria, considering both decarbonisation aspects and impacts across the wellbeing areas. In this report we present the range of findings that we feel are most indicative of the assessment and relevant to the project purpose. However, the assessment spreadsheet provides a tool that can be used to explore a wider range of findings and perspectives arising from the assessment.

2 Assessment approach

2.1 Clarifying options to assess

The first step in the project was to analyse the initial list of options set out in the Strategic Overview. It was agreed with Canterbury Regional Council that the list needed further refinement to be capable of assessment. Some options were a set of multiple different options; some were not sufficiently concrete or tangible to assess; and others were deemed to be enabling actions or conditions (*enablers*) that presented ways in which councils might implement, incentivise or enable different options.

Some illustrative examples of options that were deemed too broad for assessment include:

- Agriculture, forestry and land-use - Promote use of Mātauranga Māori in the development of low-emissions solutions.

- Agriculture, forestry and land-use - Review Good Management Practice guidelines alongside industry and Crown Research Institutes/Public Research Organisations.
- Energy - improve availability of biomass and related alternatives.
- Industrial processes and product use - promote product stewardship and take-back schemes.

Some illustrative examples of options that were deemed to be *enablers* include:

- Funding and finance - leverage council investment priorities, levies and funding to support businesses and communities through the transition.
- Funding and finance – LGFA loans (low-emissions, energy efficient homes and buildings, supporting innovation and sustainable production in the primary industries and afforestation, and transport mode shift).
- Energy - greater investment in innovation (focusing on grid decarbonisation and energy efficiency).
- Transport - enable, advocate for and promote greater use of technology that supports reduced transport emissions (freight as well as public and private transport).
- Industrial processes and product use - consider how regulatory levers and greater sharing of information could be used to promote reduced emissions.

A final set of 53 options and 28 *enablers* were developed from the initial list. This final list of options was confirmed by Canterbury Regional Council and it was agreed that only the options would be assessed, with the enablers being insufficiently concrete or tangible for meaningful assessment. The 53 options were clustered into the five categories established in the Strategic Overview:

- Agriculture, forestry and other land use
- Energy
- Transport
- Waste
- Industrial process and produce use

Many of the enablers were initially categorised as *cross sector* options. Other enablers were identified from within the categories of options above. We have re-categorised the enablers into eight categories as set out below (see **Appendix E** for the full list of enablers).

- Advocacy to government and other stakeholders.
- Partnerships and collaboration.
- Planning, consenting and urban form.

- Funding and finance.
- Data, information and skills.
- Technology and innovation.
- Energy transition support.
- Waste and circular economy.
- Developing the assessment framework.

The assessment framework was developed to address six thematic areas:

- Decarbonisation – Greenhouse Gas (**GHG**) reduction.
- Environmental wellbeing.
- Social wellbeing.
- Cultural wellbeing.
- Equity wellbeing.
- Economic wellbeing.

Canterbury Regional Council requested the equity wellbeing area to be a specific focus of the assessment due to the importance of this issue in Action 2, which explicitly requires an *equitable* and *inclusive* decarbonisation approach.

The specific criteria assessed under each theme (**assessment criteria**) are set out in the graphic below.

GHG reduction	Environmental	Social	Cultural	Equity	Economic
• Scale of potential GHG reduction • Technical feasibility of option • Likelihood of adoption • Time to material impact • Lead time to implement • Measurability of potential GHG reduction • Level of council influence • Alignment with existing policies	• Biodiversity protection / risk • Habitat disruption and restoration • Climate resilience of ecosystems • Resource use (land, water, minerals) • Air and water quality • Non-GHG polluting emissions	• Health • Safety • Accessibility to services • Mobility • Political voice and democratic participation • Community cohesion and social connection • Cost of living and energy affordability • Opportunities for work and income • Disruption or benefit to daily life	• Protection or enhancement of mātauranga Māori • Inclusion in planning and decision-making • Access to culturally important sites, practices or landscapes • Indigenous values alignment • Risk of cultural loss or erosion • Intergenerational knowledge or community continuity	• Distribution of costs, benefits and choice burdens • Intergenerational fairness • Barriers to participation • Risk of reinforcing disadvantage	• Investment required and capital access • Economic risk or opportunity for affected industries • Job creation or loss • Local vs national value chain impact • Innovation or diversification benefits • Long-term economic returns vs short-term costs

The assessment criteria for GHG reduction were developed and refined by reviewing existing examples of decarbonisation action plans for Auckland City Council, Wellington City Council and Christchurch City Council, and various overseas examples. The criteria for the wellbeing themes were developed with reference to a range of science-based sustainability frameworks including the Sustainable Development Goals, the Future-Fit Business Benchmark, Planetary Boundaries and Doughnut Economics. The cultural criteria were developed with reference to the foundational principles underpinning Te Tiriti o Waitangi – Participation, Protection and Partnership and also left sufficiently wide to include assessment of impacts to non-Māori cultural and heritage interests.

The 39 assessment criteria were presented to Canterbury Regional Council and agreed as an appropriate basis for the assessment framework. We then developed a spreadsheet-based assessment framework using those criteria, applying a scoring methodology for each of the criteria.

The scoring criteria for the GHG reduction assessment was qualitative, ranking each of the criteria on an estimated basis using existing knowledge and internal peer review. The scope of this project does not extend to more detailed and accurate evaluation of decarbonisation potential; but is the focus of a separate and more specific emissions reduction planning project.

The GHG reduction assessment scoring approach is set out in the graphic below.



The wellbeing themes applied a semi-quantitative assessment for each option against each of the agreed assessment criteria. This assessment weighed up the overall risks and opportunities identified for each of the criteria assessed to provide an overall score for the option in each theme. The scoring methodology for the wellbeing themes was developed from the Global Reporting Initiative Standards GRI 3: 2021 methodology for assessing the materiality of sustainability topics. This approach was chosen as a proven methodology that is widely used in New Zealand and globally. Using this approach involves assessing potential impacts against a combination of:

- Scale – the severity of negative impacts or degree of benefit from positive impacts.
- Scope – the extent of the impact (negative or positive). For example, the number of people, groups, industries or communities impacted; or the geographical extent of impact – local, regional, national or universal.

The complete set of scoring methodologies is set out in a separate tab in the assessment spreadsheet.

An example of the assessment scoring approach for the wellbeing theme areas is set out below. For each wellbeing area the scale scoring criteria remain the same, from -5 to +5. For scope scoring, the example below reflects the social and cultural wellbeing criteria. The scoring range, from 1 – 5, remains the same for other wellbeing areas; but the criteria is adjusted to suit the nature of the theme area being evaluated.

Scale of impact	
-5	Very high – Negative impact is profound
-4	High – Negative impact is significant
-3	Medium – Negative impact is considerable
-2	Low – Negative impact is noticeable
-1	Very low – Negative impact is negligible
0	Neutral – No impact
+1	Very low – Positive impact is negligible
+2	Low – Positive impact is noticeable
+3	Medium – Positive impact is considerable
+4	High – Positive impact is significant
+5	Very high – Positive impact is profound

Scope of impact	
5	Universal – Impacts global / national communities
4	Extensive – impacts entire regions
3	Broad – impacts multiple communities
2	Moderate – impacts a few communities
1	Minimal – Impacts isolated individuals

Using this approach, the assessment framework was tested using five options across five different option categories. These initial assessments were presented to Canterbury Regional Council and the approach was approved. It was clarified at this review stage that the scoring approach for both decarbonisation criteria and across the wellbeing assessment necessarily involved a degree of estimation, balancing a variety of risks and opportunities to reach the final assessment and scores for each option. Accompanying commentary in the assessment provides a rationale for the scoring.

What became clear quickly during the assessment was that the actual nature and extent of risks and opportunities across the wellbeings ultimately depending on how the option was implemented. For example, the implementation of an option might be specifically designed to mitigate environmental impacts, or engage mana whenua as partners at an early stage. If that were the case, environmental and cultural wellbeing impacts would be increased.

The review at this stage confirmed that the scoring approach was a useful way to compare different options, on the basis of a consistent assessment approach; and that – whilst a range of assumptions about how options might be implemented had to be implied – the assessment approach was identifying all the relevant issues to be considered under each wellbeing theme.

2.2 Assessment methodology

The initial assessment involved a total of 53 options against 39 criteria. However, by the end of the project, the number of options had increased to 57. Two of the 53 options were combined as a result of the assessment, reducing the initial list to 52; and a further five new options were subsequently added during the CCWG review, giving a total of 57 options. 32 source documents were identified as particularly relevant to the assessment. These comprised documents referred to in the Strategic Overview, documents shared by Canterbury Regional Council and other recently released reports. A full list of these source documents is set out in **Appendix A**.

Given the limited budget to carry out the assessment, and the breadth of criteria to be assessed, T+T developed an in-house AI based Generative Pre-trained Transformer (GPT) using ChatGPT to streamline the process. A set of tailored prompts were developed to ensure a consistent approach for assessing each option and applying the scoring methodology. The set of prompts used are set out in **Appendix B**. In addition to the source documents, the GPT was able to access relevant publicly available information from the internet. The assessment spreadsheet records which source information the GPT used for each aspect of the assessment.

The assessment framework and relevant source documents were uploaded to the GPT and initial assessments were used to train the model. This included the five initial options assessed which were reviewed and approved by Canterbury Regional Council before completing assessment of the remaining options.

In addition, T+T developed a closed GPT using the same prompts. This GPT could only access the 32 source documents and did not have access to wider information from the internet. This effectively ensured a 'source of truth' to ensure the GPTs with access to wider information were not 'hallucinating' or making up answers.

As each option was processed by the open GPTs, answers were reviewed by the T+T team as they were transferred into the assessment framework. That review involved:

- Checking answers and reviewing allocated scores based on T+T's professional sustainability expertise and knowledge, as well as their understanding of the local Canterbury context.
- Further research where required to test and check answers.
- Checking answers against the closed GPT 'source of truth' for comparability.

2.2.1 Review with subject matter experts

After completing the assessment of all the options, the T+T team had internal working sessions with subject matter experts in decarbonisation, emissions reduction planning, and Te Ao Māori and tikanga Māori. These sessions focused on a review of decarbonisation, cultural wellbeing and equity wellbeing criteria.

As a result of the review, some minor adjustments were made to the assessment of decarbonisation criteria scoring to better reflect the New Zealand and Canterbury context. Some scores within the cultural wellbeing theme were also adjusted, particularly to reflect the positive cultural impact of decarbonisation initiatives being in general alignment with Te Ao Māori principle of kaitiakitanga and Māori values reflecting care for people and the environment. It was noted by T+T's internal subject matter expert that local engagement with relevant Rūnanga and mana whenua would be required to achieve a more accurate assessment of each option to reflect particular local context and cultural values.

Following the review with T+T subject matter experts, the complete assessment was reviewed by CCWG subject matter experts in a workshop held at Canterbury Regional Council on 15th August 2025. The workshop broke into three separate groups to review different aspects of the assessment as follows:

- Richard Mabon (Ashburton District Council) and Angie Scott (Canterbury Regional Council) reviewed all options and content in the Agriculture, Forestry and Land Use and Waste categories.
- Tammy Phillips (Canterbury Regional Council) and Joe Gentilcore (Selwyn District Council) reviewed all options and content in the Energy and Industrial Processes and Product Use categories.
- Nicole Lynds (Canterbury Regional Council) and Tony Moore (Christchurch City Council) reviewed all options and content in the Transport category.

It wasn't possible to complete the entire review during the time allocated for the workshop. The same workshop groups reconvened to complete the review and sent through the revised scores along with additional comments to amend commentary in the assessment spreadsheet.

Developing the final list of options in the assessment spreadsheet

During the review of the Transport options, an additional five options were identified and scored across all criteria except under the cultural wellbeing theme. T+T used the same GPT to complete the cultural wellbeing assessment scoring of those five new options. However, being outside the scope of the project work and budget, commentary to explain the scoring rationale, barriers, assumptions, risks and other implications of these five additional options has not been generated. The commentary sections for those five options remain blank in the assessment spreadsheet.

Given that the five additional options have been scored consistently with all other options, they are included in the final assessment findings.

As a result of the CCWG review of options in the Waste category, it was agreed that two options effectively covered the same decarbonisation initiative relating to using anaerobic digesters to recover energy from organic waste. It was decided to combine these options into one.

As a result of the review process, therefore, the final completed assessment includes a total of 57 options.

2.3 Assessment challenges and limitations

Scope and certainty of options: Despite reframing the initial list of options from the Strategic Overview, some are still reasonably broad as regards exactly how they might be designed and implemented as concrete initiatives. That could only be avoided by fully scoping the options into implementable initiatives, which was beyond the scope of this project. The implications of this are twofold:

- The emissions reduction impact of options may be higher or lower depending on the final scope. For example, if the agricultural option relating to *Promote incorporation of GHG reductions into Good Management Practice guidelines and enforce through consent condition* covers fuel, energy and fertilizer use on farms it is likely to have a more significant impact on emissions reduction. As another example, the emissions reduction impact of the option relating to *Support waste avoidance with re-use and repurposing of resources* will depend upon the range of materials covered by that initiative.
- Risks and opportunities arising under all the wellbeing themes will ultimately be determined by the way initiatives are designed and implemented. For example, in terms of cultural wellbeing, the GPT assumed that business as usual practices generally apply a sub-optimal approach to co-design and full participation with Rūnanga and mana whenua stakeholders. However, if initiatives are specifically designed to maximise the potential for working in partnership with those stakeholders, the cultural wellbeing scores are likely to be higher. By the same token, many of the initiatives could be designed in ways that maximise environmental, social or economic benefits. For the purposes of the assessment, the scoring approach adopted has assumed a 'business as usual' approach – in so far as that could be estimated.

Scoring approach: Risks and opportunities arising under the wellbeing areas were assessed by their scale and scope. These assessments are necessarily estimates, rather than a scientifically defensible quantification. The estimations are supported and explained by commentary in the assessment spreadsheet and have been reviewed by subject matter experts, as set out above. This approach provides a starting point for comparison using a consistent semi-quantitative assessment approach.

Stakeholder perspectives: Whilst a variety of stakeholders may subjectively have different views about the significance of risks and opportunities for wellbeing themes; the assessment has identified a comprehensive range of relevant issues. The next step of work involves weighing and assessing those issues as part of the stakeholder engagement phase and final decision-making process about which options to include in the regional transition plan.

3 Outcomes and findings

3.1 Outcomes

The assessment has delivered an analysis of emissions reduction potential and wellbeing risks and opportunities with accompanying commentary for 52 options, and a semi-quantitative scored assessment for all 57 options (full commentary was not possible for the five new options added during the CCWG review, as explained above). This is all contained in the assessment spreadsheet which offers an ongoing tool that can be used for the subsequent phases of work to develop a regional transition plan. As an analytical tool, the spreadsheet provides:

- A means of filtering and reviewing all options based on:
    - Scale of potential GHG reduction
    - Technical feasibility
    - Likelihood of adoption

  - Lead time to implement
  - Time to material emissions reduction impact
  - Measurability of potential GHG reduction
  - Level of council influence
  - Alignment with existing policies
  - Environmental wellbeing
  - Social wellbeing
  - Cultural wellbeing
  - Equity wellbeing
  - Economic wellbeing

- The ability to list all options in ranked order of their overall wellbeing risk and opportunity scores.
- The ability to adjust the weighting applied to one or more of the wellbeing themes.

3.2 Findings

The full list of all 57 options is presented in two different ways in **Appendix C** and **Appendix D.** These show:

- **Appendix C** set out the options in order of their total wellbeing risk and opportunity assessment scores, from the option with the highest overall wellbeing impacts to the option with the lowest overall wellbeing score.
- **Appendix D** sets out the options in order of high to low emissions reduction potential. Each group is set out from highest to lowest overall wellbeing score.

Below, we present a range of findings using specific filters agreed with Canterbury Regional Council for this report. Against each one, we offer short commentary to provide additional context. The filters applied cover:

3.2.1 - Highest overall wellbeing score.

3.2.2 - High emissions reduction potential / High council influence / Overall wellbeing score.

3.2.3 - High emissions reduction potential / Low council influence / Overall wellbeing score.

3.2.4 - High emissions reduction potential / High positive equity impact / Overall wellbeing score.

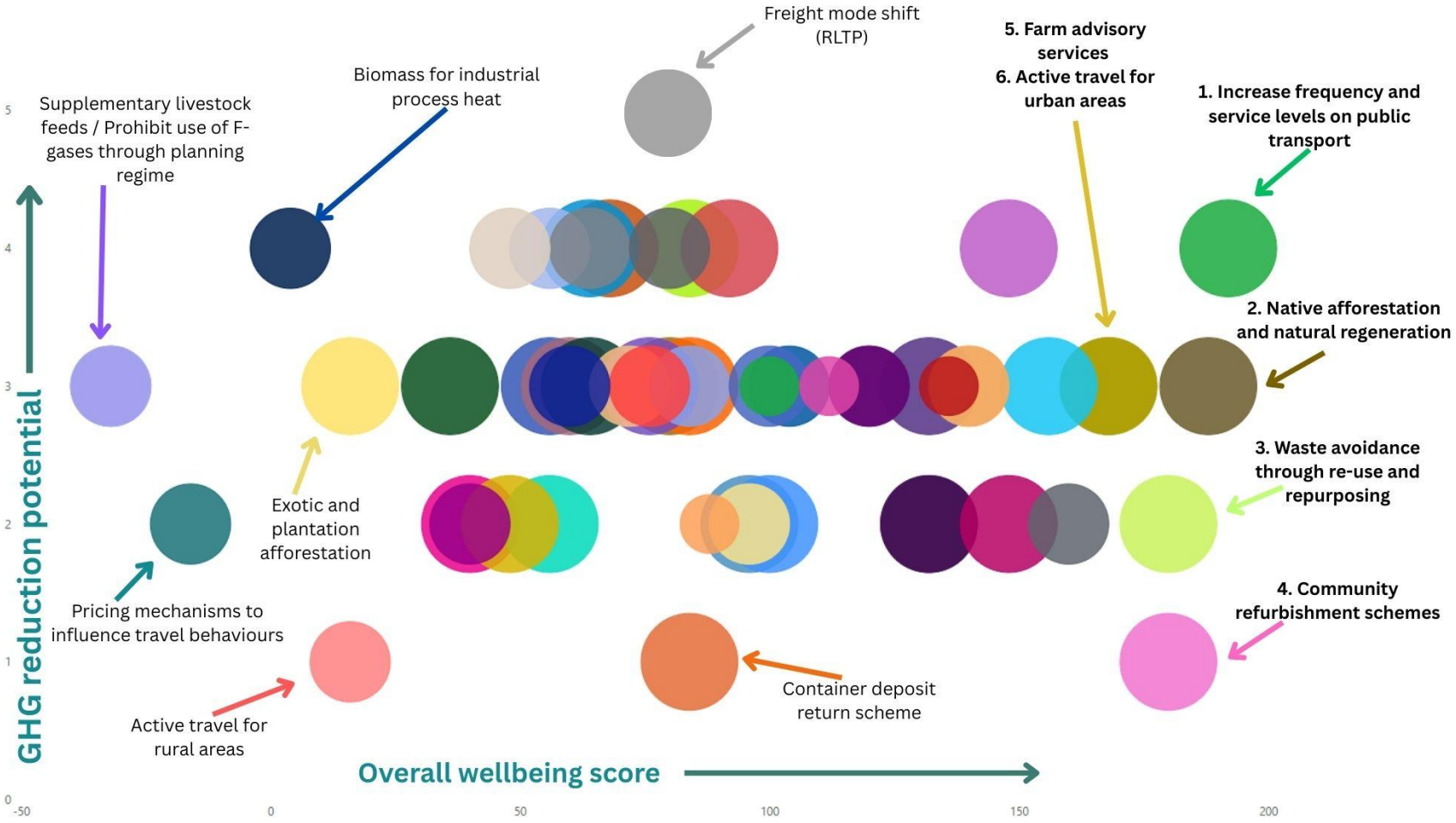
3.2.5 - High emissions reduction potential / High positive economic impact / Overall wellbeing score.

3.2.6 - High emissions reduction potential / Short-term emissions reduction impact / Overall wellbeing score.

3.2.1 Highest overall wellbeing score

										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	Medium	High	Strong	24	32	24	64	48	192	38.4%	**1**
Agriculture, forestry and other land use	Support native afforestation and natural regeneration across the region, including restoring wetlands and indigenous biodiversity	Moderate	Medium	Medium	Long (10+ years)	Short (1-3 years)	Medium	High	Strong	64	24	60	24	16	188	37.6%	**2**
Waste	Support waste avoidance with re-use and repurposing of resources (e.g. through for-purpose organisations)	Low	Medium	Medium	Medium (3-10 years)	Short (1-3 years)	Low	Medium	Strong	48	36	24	36	36	180	36.0%	**3**
Waste	Partner with small enterprises to establish community refurbishment schemes	Very low	High	Medium	Medium (3-10 years)	Short (1-3 years)	Unknown	Medium	Strong	36	48	24	48	24	180	36.0%	**3**
Agriculture, forestry and other land use	Promote use of farm advisory services	Moderate	Medium	High	Medium (3-10 years)	Short (1-3 years)	Medium	High	Strong	36	24	24	36	48	168	33.6%	**5**
Transport	Promote active travel (cycling, scootering and walking) for urban areas	Moderate	High	Medium	Medium (3-10 years)	Short (1-3 years)	Medium	Medium	Strong	32	40	24	24	48	168	33.6%	**5**

These options are identified on the right-hand side of the graphic below, numbered 1 to 6. The graphic showing all options assessed and, for reference, it also highlights the options with the lowest overall wellbeing scores, as well as those with the highest and lowest assessed emissions reduction potential.



Graphic showing all options and identifying those scoring highest and lowest for overall wellbeing and GHG emissions reduction potential.

Observations

- The six highest scoring options for wellbeing risks and opportunities are all implementable in the short term, with all but one expected to yield emission reductions in the medium term. For three options, councils have a high level of influence and estimated carbon reductions are high or medium. These characteristics suggest the options should be explored further with stakeholders as options with strong merits. It should be noted, however, that the two waste avoidance initiatives (ranking 3rd and 4th have 'low' and 'very low' anticipated emissions reduction potential respectively.
- *Increase frequency and service levels on public transport*: This initiative ranks highest due to particularly high equity benefits and high economic benefits. It is also an option where councils have high influence. Emissions reduction potential is high, though uptake depends on wider behaviour change and supporting infrastructure. The option is technically feasible but requires sustained investment and coordination. Benefits extend beyond emissions, improving accessibility, cost of living, and social cohesion.
- *Native afforestation and natural regeneration*: This option scores strongly on environmental and cultural wellbeing, reflecting biodiversity protection, water quality, and alignment with mātauranga Māori. GHG reduction potential is moderate, but impacts are long-term, with benefits evident only after a decade or more. Councils have significant influence through planning and partnerships, but financing and land availability are dependencies. Engagement with mana whenua and rural communities will be critical for equity.
- *Community refurbishment schemes*: Though GHG reduction potential is very low, this initiative scores highly on social and equity outcomes, benefiting affordability, local enterprise, and community connection. Highly feasible and quick to implement, but emissions impacts are hard to measure. This option shows how "low-carbon" actions can still enable progress by building capability and reducing barriers, especially for lower-income households.
- *Support organisations enabling re-use and repurposing of resources*: This initiative has low direct emissions reduction potential (depending on materials included in any scheme) but aligns with a circular economy approach and produces clear social and equity benefits. Measurability is limited, with outcomes reliant on assumptions and indirect impacts. Councils' influence is moderate, via funding, partnerships, and policy. Despite modest GHG reductions, it can shift norms towards resource efficiency and waste minimisation.
- *Farm advisory services*: Farm-level advisory services have moderate emissions reduction potential, mainly by supporting adoption of proven practices. Feasibility is reasonable, though dependent on farmers' willingness and capacity. Councils have high influence, especially if linked to planning, consenting, and funding. Environmental and economic outcomes are positive, but equity considerations are needed to avoid disadvantaging smaller or less-resourced farms.
- *Active travel for urban areas*: Active travel has strong co-benefits for health, mobility, and cost of living. Emissions reduction potential is moderate, and the initiative is technically feasible and aligned with councils' influence on infrastructure and planning. Uptake depends on urban form and supporting infrastructure, highlighting the need to integrate with land-use planning. Equity benefits are positive, but design must ensure safe and accessible infrastructure across communities.

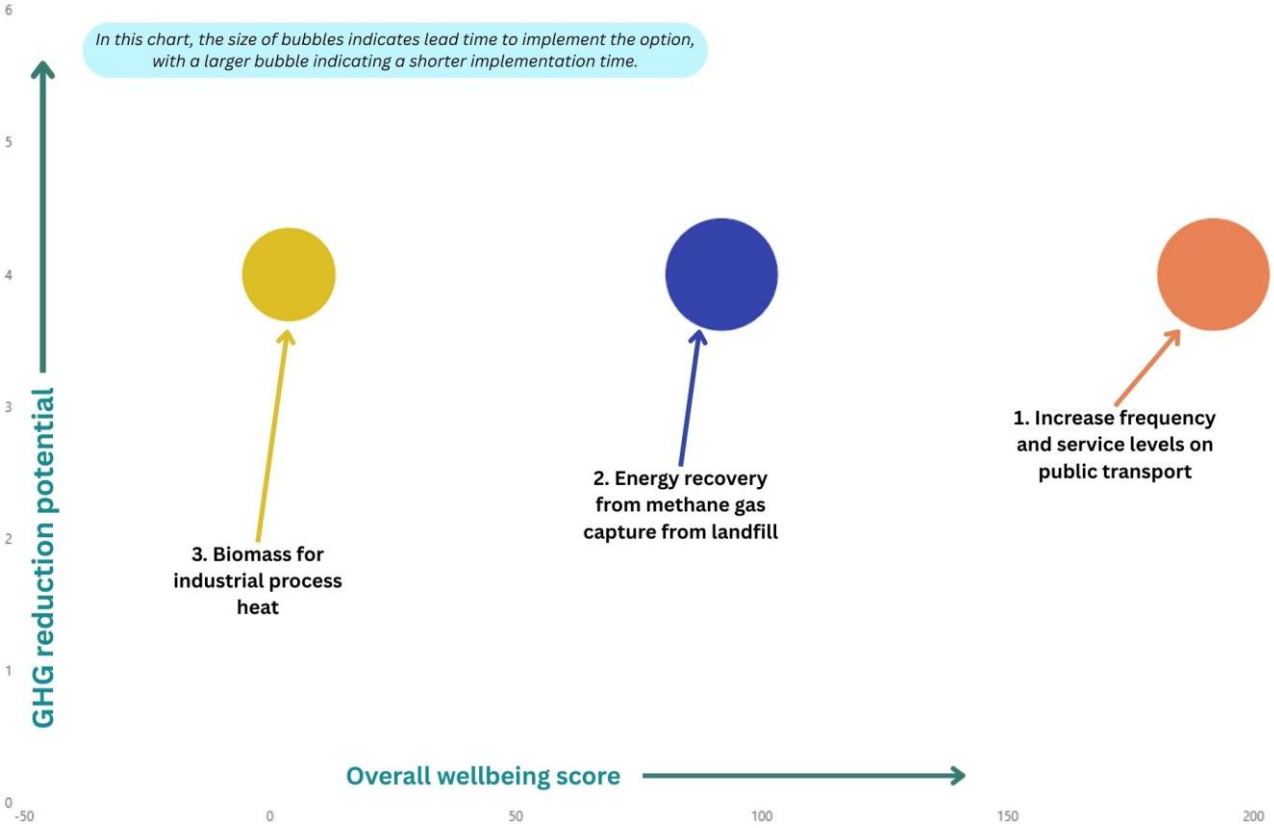
3.2.2 High emissions reduction potential / High council influence / Overall wellbeing score

										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	Medium	High	Strong	24	32	24	64	48	192	38.4%	**1**
Waste	Energy recovery from methane gas capture from landfill	High	High	High	Medium (3-10 years)	Short (1-3 years)	High	High	Strong	32	24	12	8	16	92	18.4%	**26**
Energy	Raise understanding and help facilitate increased use of biomass for industrial process heat	High	Medium	Medium	Medium (3-10 years)	Medium (3-10 years)	High	High	Strong	-32	-12	12	0	36	4	0.8%	**54**

Observations

- Increasing the frequency, service levels and customer experience on public transport has high emissions reduction potential, is an area where local government has significant control and influence; and is the highest scoring option in terms of positive wellbeing impacts. This option:
    - Has the highest positive equity score of all options.
    - Has the second highest positive economic score.
    - Can be implemented reasonably quickly but will take some time to achieve emissions reduction objectives because of the time lag in building patronage numbers.
- Energy recovery from methane gas capture at landfills is a high emissions reduction solution that is proven and can be implemented reasonably quickly. The lower overall wellbeing score for this initiative is dragged down by high up-front capital costs and the potential for increasing inequity. The capital costs may translate into higher rates or gate fees, affecting lower-income households. Smaller councils may also, arguably, struggle to fund high-performance gas capture systems, thereby missing out on the potential benefits.

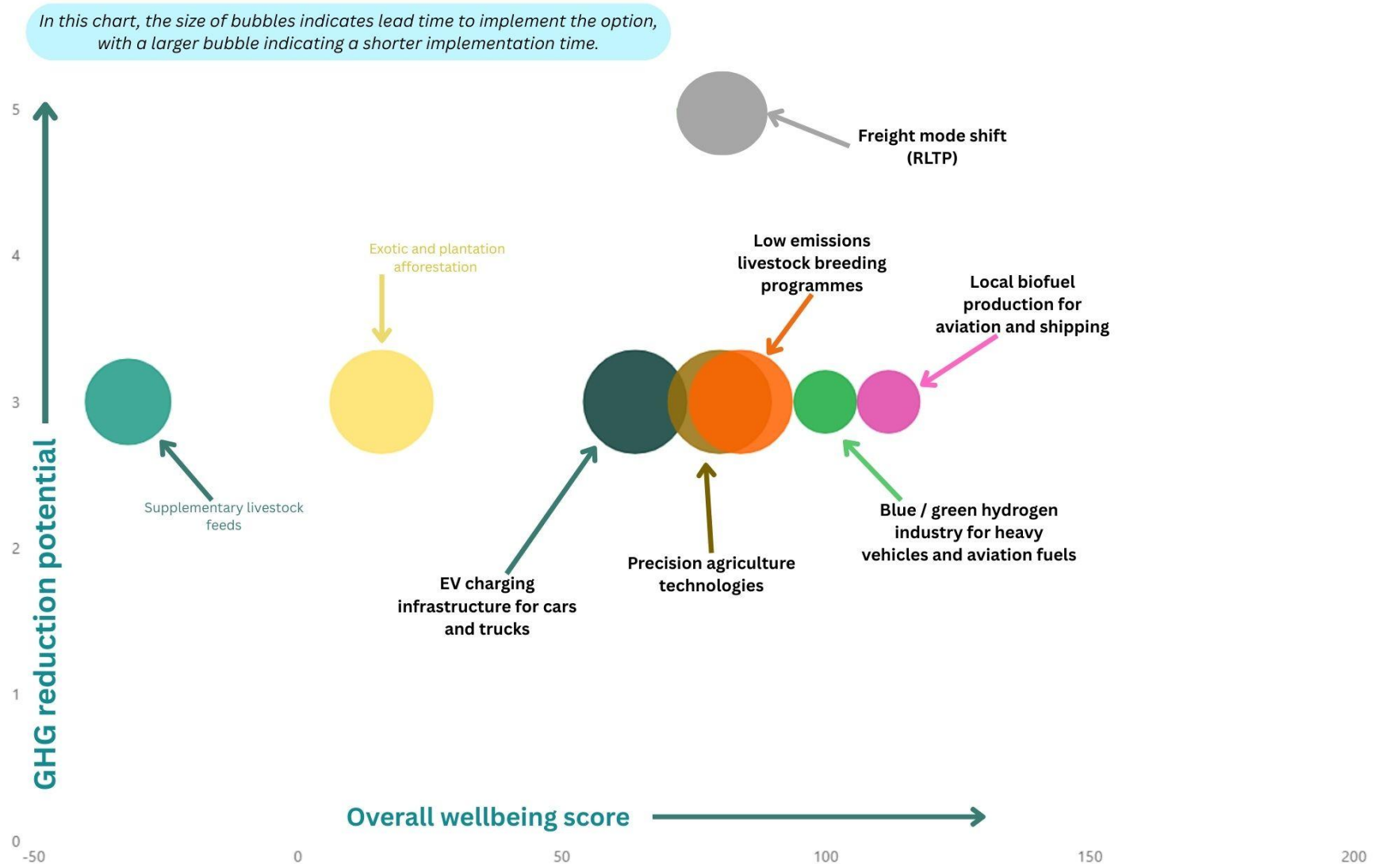
- Facilitating an increased use of biomass for industrial process heat is one of the lowest scoring options in terms of overall wellbeing impacts, despite a reasonably positive economic wellbeing score. Securing feedstock for biomass facilities presents environmental risks for biodiversity and habitat protection and, at scale, can become an intensive land-use that also affects water availability. The option also presents a slightly negative social wellbeing impact as a result of air quality risks.
  This option also has a longer implementation lead time, so offers less immediate carbon emission reductions; and, whilst council influence is high in terms of consenting levers under National Environmental Standards, it is reliant on private sector investment for non-council owned assets.



Graphic showing the three options having a high GHG reduction potential and a high level of council influence; with their comparative wellbeing ranking.

3.2.3 High emissions reduction potential / Low council influence / Overall wellbeing score

										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Transport	Promote and support the Regional Transport Committee's work to enable freight mode shift to shipping and rail (see RLTP for initiatives)	Significant	Medium	Medium	Long (10+ years)	Medium (3-10 years)	High	Low	Strong	32	24	16	-16	24	80	16.0%	**32**
Transport	Enable the local bioenergy sector to provide second generation biofuels for aviation and shipping (e.g., Sustainable	Moderate	Low	Medium	Long (10+ years)	Long (10+ years)	Medium	Low	Partial	36	16	8	16	36	112	22.4%	**19**
Transport	Support a blue / green hydrogen industry to provide fuels for heavy vehicles and aviation	Moderate	Low	Low	Long (10+ years)	Long (10+ years)	High	Low	Partial	32	24	8	12	24	100	20.0%	**21**
Agriculture, forestry and other land use	Promote low-emissions livestock breeding programmes	Moderate	High	Medium	Long (10+ years)	Short (1-3 years)	Low	Low	Partial	32	16	12	-24	48	84	16.8%	**28**
Agriculture, forestry and other land use	Promote precision agriculture technologies	Moderate	Medium	Medium	Short (1-3 years)	Short (1-3 years)	Medium	Low	Strong	36	24	0	-16	36	80	16.0%	**32**
Transport	Support and encourage installation of EV charging infrastructure for cars and trucks through the region	Moderate	High	Medium	Medium (3-10 years)	Short (1-3 years)	Low	Low	Strong	24	24	16	-24	24	64	12.8%	**39**
Agriculture, forestry and other land use	Support exotic and plantation afforestation	Moderate	High	High	Long (10+ years)	Short (1-3 years)	Medium	Low	Partial	-24	12	12	0	16	16	3.2%	**52**
Agriculture, forestry and other land use	Promote supplementary livestock feeds that lower emissions	Moderate	Medium	Medium	Medium (3-10 years)	Medium (3-10 years)	Low	Low	Partial	-16	4	-16	-16	12	-32	-6.4%	**56**



Graphic showing the options where councils have a low level of influence positioned by their emissions reduction potential and overall wellbeing score.

Observations

- Canterbury Regional Council is interested in understanding options where there is low council influence and high emission reduction potential because implementing those options will rely much more on effective stakeholder engagement and activation. In the category of 'low council influence', there is only one option with 'significant' emissions reduction potential and none which were assessed as having 'high' GHG emissions reduction potential. As a result, we have added those options with a 'moderate' level of GHG emissions reduction.
- All options in this selection, which will require specific attention to stakeholder engagement, fall within the Transport and Agriculture, Forestry and Other Land Use categories.
- Enabling freight mode shift to ship and rail transport was the only option of all 57 assessed as having a 'significant' emissions reduction potential. This is a long-term initiative, with a moderate lead time to implement, and will take a significant time to achieve material emissions reduction impact. It is highly reliant on non-council stakeholders and investment, although Lyttelton Port is owned by Christchurch City Council and Timaru Port is partly owned by Timaru District Council – so there may be limited potential for council influence. Freight mode shift policies may also be challenged by road freight industry bodies and companies which have significant sunk investment costs in the current vehicle fleet.
- The two options with the higher wellbeing impacts: *Local biofuel production for aviation and shipping* and *Hydrogen fuels for heavy vehicles and aviation* are both long-term plays, with an estimated implementation period of 10+ years. They are also initiatives that will take a considerable amount of time to have a material emissions reduction impact and have a low current technical feasibility.
- The 3rd, 4th and 5th options in this selection have negative equity wellbeing scores. The required investment in precision agriculture technologies is likely to favour larger and well-capitalised farms, which will likely reinforce structural gaps in productivity and profitability. Similarly, up-front costs to participate in low-emissions livestock breeding programmes are likely to favour larger, well-capitalised farms giving them an additional competitive advantage. EV charging infrastructure also favours those with the resources to buy an EV, who then enjoy the reduced costs of ownership. That said, these initial EV purchasers will support a second-hand market which increases accessibility to more affordable EVs for others over time. However, there is also an argument that more effective public transport could actually reduce the need for private vehicle ownership of all types and is, from a systemic perspective, better aligned with a genuinely sustainable future.
- Despite economic benefits and drivers associated with the Emissions Trading Scheme (**ETS**), exotic and plantation forestry scores poorly on the basis of negative environmental impacts, with specific risks for native biodiversity, habitat and water catchment impacts for an activity that could involve significant amounts of land-use. Forestry also poses broader risks if not well managed, contributing to increased pests and risks from post-harvest slash during significant rainfall events.
- Supplementary livestock feeds can present environmental risks, depending on how and where they are produced. There are also issues with cultural values alignment if synthetic feed products conflict with natural systems and food sovereignty values; and equity risks where costs or farming practices make the use of supplementary feeds impossible or impractical.
- Of this selection, only *Support exotic and plantation afforestation* has a high likelihood of adoption; and only three options are rated as 'high' for current technical feasibility. This suggests that these three would have a higher level of interest with relevant stakeholders:

- *Promote low-emissions livestock breeding programmes*
- *Support and encourage installation of EV charging infrastructure for cars and trucks through the region*
- *Exotic and plantation afforestation*

3.2.4 High emissions reduction potential / High positive equity impact / Overall wellbeing score

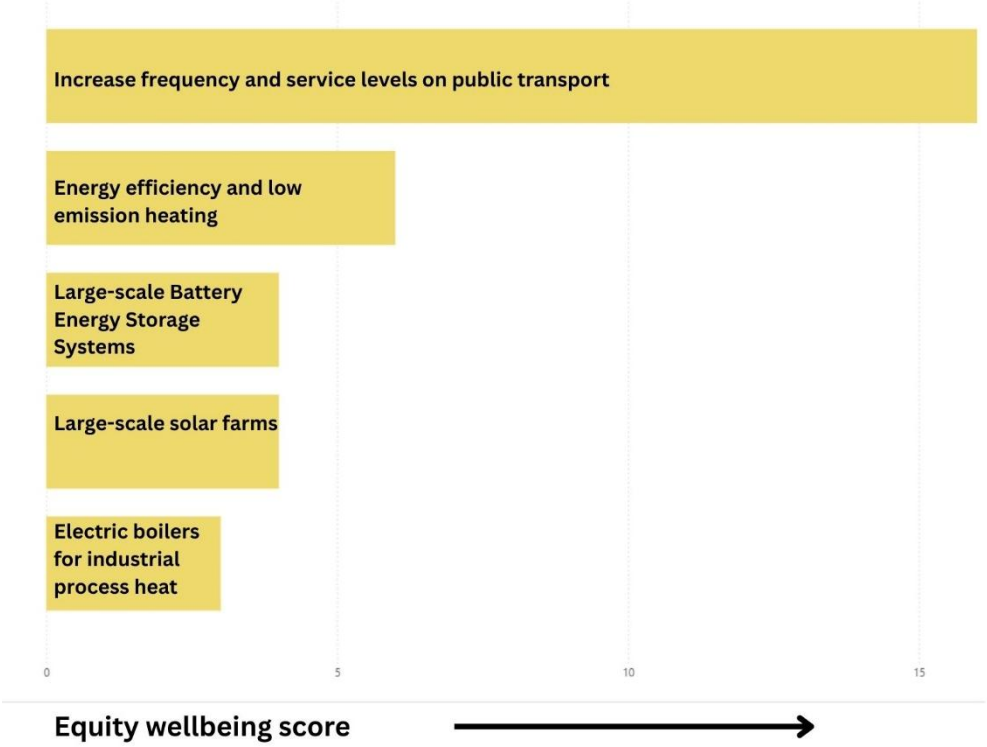
										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	Medium	High	Strong	24	32	24	64	48	192	38.4%	**1**
Energy	Partner collectively and / or with EECA to increase investment in energy efficiency and low emission heating sources in houses, commercial and industrial buildings.	High	High	Medium	Medium (3-10 years)	Short (1-3 years)	High	Medium	Strong	36	48	24	24	16	148	29.6%	**9**
Energy	Support development of large-scale Battery Energy Storage Systems	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	High	Medium	Strong	-8	12	0	16	64	84	16.8%	**28**
Energy	Support development of large-scale solar farms	High	High	High	Short (1-3 years)	Medium (3-10 years)	High	Medium	Strong	-8	12	12	16	48	80	16.0%	**32**
Energy	Raise understanding and help facilitate increased use of electric boilers for industrial process heat	High	High	Medium	Medium (3-10 years)	Short (1-3 years)	High	Medium	Strong	24	16	8	12	8	68	13.6%	**38**



Graphic showing the options with a high emissions reduction potential and comparative wellbeing scores (numbered 1 - 5). The size of the bubbles indicates equity wellbeing ranking, with larger bubbles indicating a higher level of equity wellbeing. Those with lower equity and overall wellbeing scores are also identified for reference.

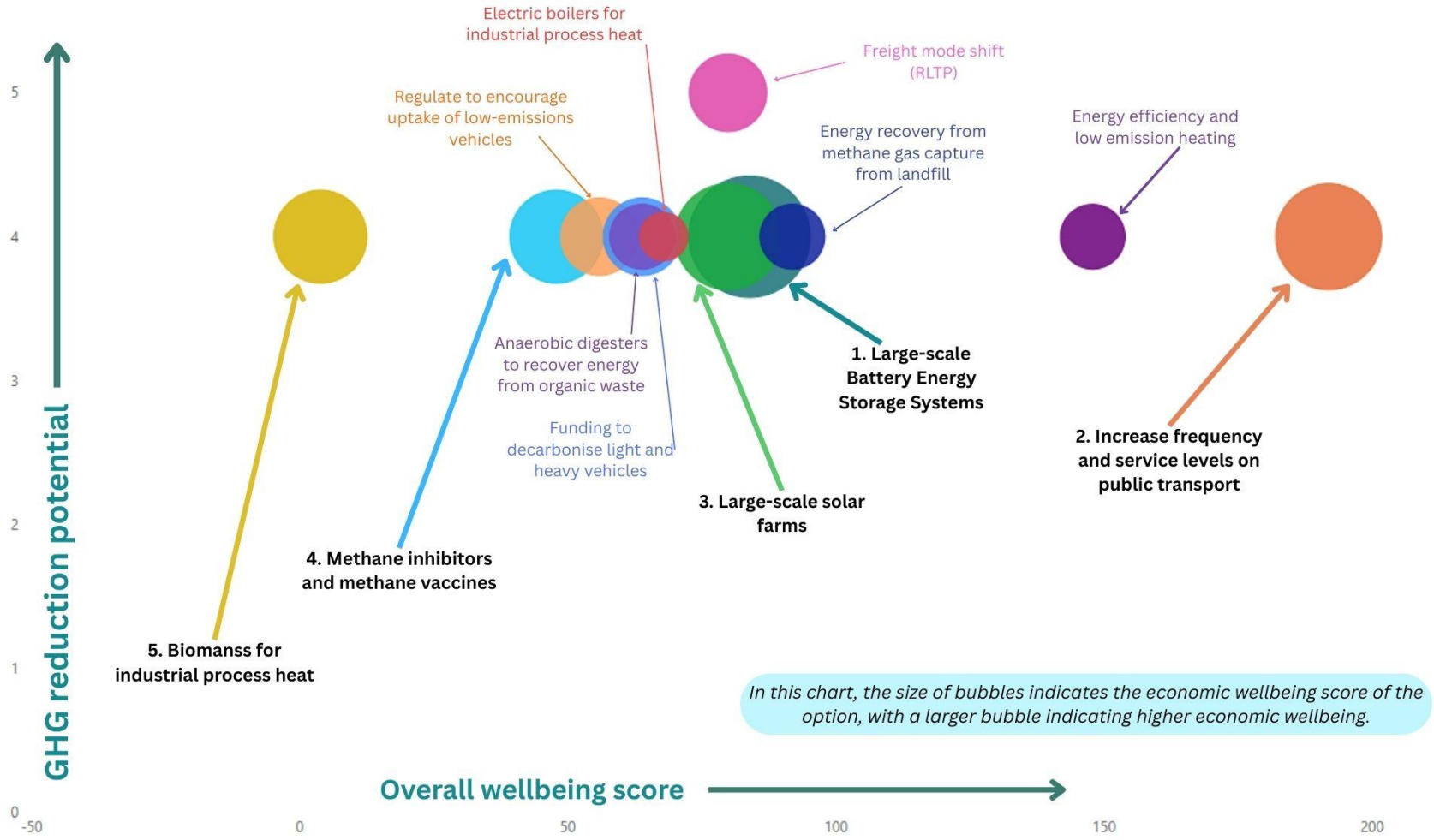
Observations

- Increasing frequency, service levels and customer experience on public transport has both high emissions reduction potential and ranks highest overall for wellbeing outcomes. It has the highest equity wellbeing score of all options, by some margin. Whilst this initiative can be implemented in the short-term, the decarbonisation impact is likely to take some time to materialise and is dependent on changing citizen behaviour.
- Supporting energy efficiency and low-emission heating through EECA funding is likely to support lower income households to both reduce emissions and improve health outcomes. This option could help overcome barriers for those in rental accommodation or who cannot access bank finance through targeted subsidies and financial support.
- Supporting large-scale battery energy storage systems (**BESS**) and solar farms can improve energy resilience for communities and provide storage to support wind and solar energy projects. This option also provides strong economic wellbeing benefits, despite high upfront capital costs. As battery costs decline and new markets for battery storage and virtual power plants emerge, financial returns are increasingly attractive. Battery storage also supports the deployment of more local solar, both grid-scale and roof-top, which is the lowest cost energy source.



3.2.5 High emissions reduction potential / High positive economic impact / Overall wellbeing score

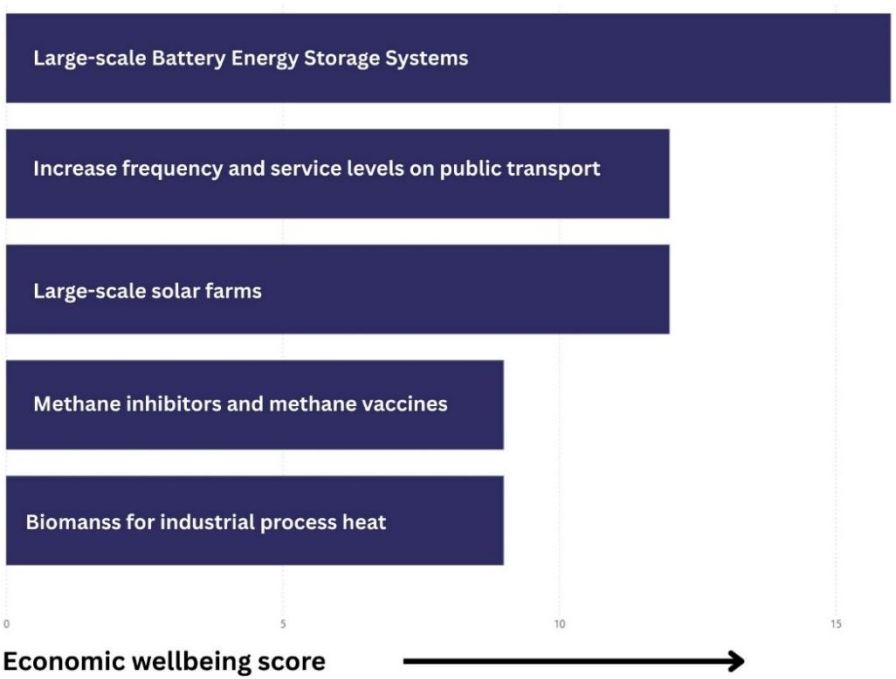
										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Energy	Support development of large-scale Battery Energy Storage Systems	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	High	Medium	Strong	-8	12	0	16	64	84	16.8%	**28**
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage	High	Medium	High	Medium (3-10 years)	Short (1-3 years)	Medium	High	Strong	24	32	24	64	48	192	38.4%	**1**
Energy	Support development of large-scale solar farms	High	High	High	Short (1-3 years)	Medium (3-10 years)	High	Medium	Strong	-8	12	12	16	48	80	16.0%	**32**
Energy	Raise understanding and help facilitate increased use of biomass for industrial process heat	High	Medium	Medium	Medium (3-10 years)	Medium (3-10 years)	High	High	Strong	-32	-12	12	0	36	4	0.8%	**54**
Agriculture, forestry and other land use	Support innovation and uptake of methane inhibitors and methane vaccines	High	Medium	Medium	Medium (3-10 years)	Medium (3-10 years)	Medium	Medium	Strong	16	24	-12	-16	36	48	9.6%	**47**



Graphic showing the options with a high emissions reduction potential and comparative overall wellbeing scores (numbered 1 - 5). The size of the bubbles indicates economic wellbeing ranking, with larger bubbles indicating a higher level of economic wellbeing. Those with lower economic and overall wellbeing scores are also identified for reference.

Observations

- In addition to the observations at 3.2.3 above, the economic returns of BESS and solar farms are likely to improve over time as demand for new grid services and flexibility increases; and as carbon prices increase. Large-scale BESS also provide short and medium-term employment opportunities in engineering, construction and systems integration; whilst agrivoltaics can provide dual income streams for landowners. BESS and solar farms, as an integrated solution, may also support investment in the region by new clean-tech industries seeking reliable and uninterrupted renewable energy supply (e.g., datacentres).
- The economic benefits of improved and more convenient public transport services are likely to improve labour market access and reduce indirect costs from congestion. This may also lift competitiveness of urban centres by improving mobility efficiency. Reduced traffic volumes will also lower road maintenance expenditure, health related costs and enhance economic participation for those without private vehicles.
- Methane inhibitors and vaccines offer one of the most economically attractive mitigation pathways for New Zealand's agriculture sector. They can potentially decouple productivity from emissions growth, allowing Canterbury and national producers to remain competitive and protect market access, while meeting domestic and international climate obligations. Developing local methane mitigation technologies could support a high-value bioeconomy and stimulate additional employment in biotechnology, research, manufacturing and advisory solutions.



- Switching industrial process heat plant to biomass can reduce long-term exposure to ETS costs and protect market access to customers seeking lower carbon products. If biomass is locally or regionally sourced, it can also support local supply chains, employment and the development of circular economy models. In Canterbury, where food processing and manufacturing are major economic drivers, biomass conversion aligns with decarbonisation goals while maintaining productive capacity. The EECA Regional Energy Transition Accelerator reports for Mid and North Canterbury region (RETA reports) identify several industrial emitters with feasible biomass switching pathways. However, if adopted at scale regionally and nationally, there could be challenges sourcing reliable quantities of biomass feedstock; and there is a growing risk that electrification may outcompete biomass on an operational cost basis. There is also a risk that biomass fuels may increasingly be associated with the negative environmental and biodiversity impacts arising from plantation forestry.

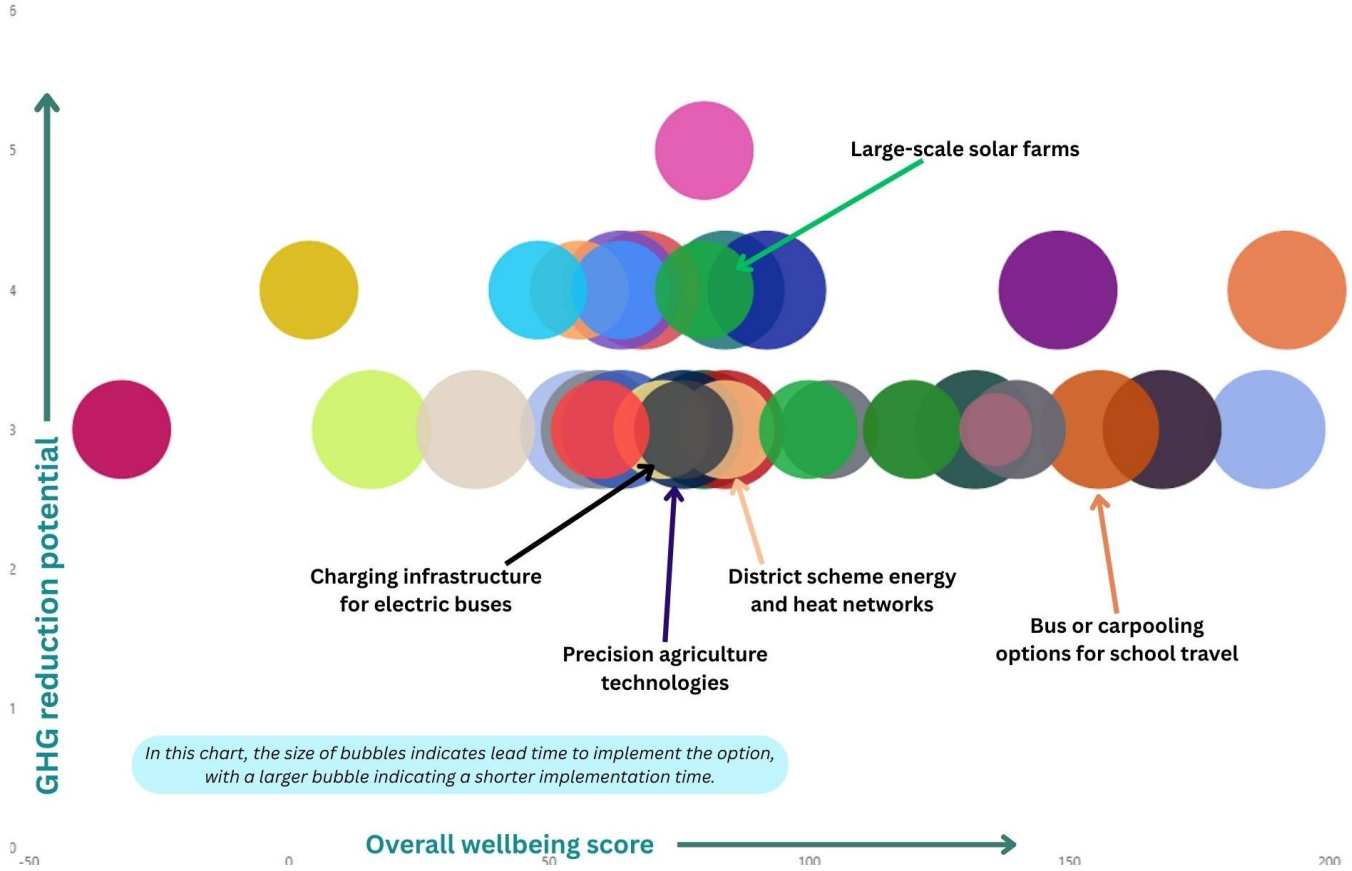
3.2.6 High emissions reduction potential / Short-term emissions reduction impact / Overall wellbeing score

										Weightings (0-1)							
										1	1	1	1	1	500		
Opportunity Attributes										Total - Normalized to lie between 0 and 100						Final results	
Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Technical feasibility of opportunity	Likelihood of adoption	Time to material impact (years)	Lead time to implement (years)	Measurability of potential GHG reduction	Level of council influence over GHG reduction initiative	Alignment of initiative with existing policies	Env	Social	Cultural	Equity	Econ	Total	Total (weighted and normalized as %)	Rank
Transport	Increase support for bus or carpooling options for travel to schools	Moderate	High	Low	Short (1-3 years)	Short (1-3 years)	Low	High	Strong	24	36	24	48	24	156	31.2%	**8**
Energy	Support district scheme energy and heat networks (provided renewables available locally, like geothermal / waste from energy) for industrial / housing developments	Moderate	Medium	Unknown	Short (1-3 years)	Medium (3-10 years)	High	Medium	Strong	12	24	16	8	24	84	16.8%	**28**
Energy	Support development of large-scale solar farms	High	High	High	Short (1-3 years)	Medium (3-10 years)	High	Medium	Strong	-8	12	12	16	48	80	16.0%	**32**
Agriculture, forestry and other land use	Promote precision agriculture technologies	Moderate	Medium	Medium	Short (1-3 years)	Short (1-3 years)	Medium	Low	Strong	36	24	0	-16	36	80	16.0%	**32**
Transport	Enable wider electric bus fleet uptake by providing high-capacity charging infrastructure	Moderate	High	Medium	Short (1-3 years)	Short (1-3 years)	High	Medium	Strong	24	24	24	-12	16	76	15.2%	**35**

Observations

- Supporting development of large-scale solar farms is the only option with high emissions reduction potential that delivers a material impact within a short period of implementation. However, solar farms can take years to develop. The implementation lead time is generally 5 – 8 years depending upon consenting requirements. Similarly, district energy schemes and heat networks can also take many years to plan, fund and implement. Both these options have 3 – 10 year implementation timeframes.
- Bus and carpooling options for school travel can be implemented more quickly with a moderate emissions reduction impact in the short-term. However, the likelihood of these initiatives being adopted is currently low with a need to change ingrained behaviours. Uptake can be supported with associated initiatives, like parking restrictions or time of use charging combined with active promotion campaigns. If successfully implemented, this option is likely to improve safety and health outcomes by reducing traffic around schools. It also has a strong equity wellbeing score because it reduces transport costs and increases access to schools for households without reliable private transport.

- Precision agriculture solutions can provide short-term emissions reduction opportunities, with technology available now to improve farm system level efficiency and reduce emissions intensity of farm produce. The cost of adopting these technologies can be a barrier, favouring well-capitalised and larger farms with risks of exacerbating existing inequalities in the agricultural sector. The level of direct council influence is also low.
- Providing high-capacity charging infrastructure for electric buses will support further decarbonisation of public transport in tandem with further electrification of the bus fleet. In Canterbury, buses make up a reasonably small proportion of regional transport emissions, so emission reductions are likely to be modest. Benefits will be increased by effectively displacing car trips by combining electrification with service improvements, enhanced routes and attractive pricing.



Graphic showing the options with a significant to moderate emissions reduction potential and comparative overall wellbeing scores. The graphic specifically identifies those options with a short-term (1 - 3 years) material emissions reduction impact following implementation.

4 Summary of insights from the assessment

4.1 Insights

Wellbeing outcomes depend on design and delivery

Across the options, it is clear that the final extent of social, cultural, environmental, economic and equity outcomes will depend upon on how intervention options are designed and implemented. For example, transport initiatives can specifically focus on improving accessibility and community cohesion and, thereby, the extent of wellbeing outcomes. A wellbeing focused approach, for example, is likely to favour improvements to public transport over supporting a larger privately owned fleet of EVs.

Equity is the cornerstone of a just transition

Action 2 explicitly requires inclusive and equitable emissions reduction pathways and, therefore, the distribution of costs and benefits should be central to decision-making. The assessment shows that some options have potential to entrench disadvantage if not carefully managed, particularly for some rural, low-income or mobility-constrained groups. Conversely, well-chosen and designed interventions can ease cost-of-living pressures, improve access, and support intergenerational fairness. Again, design of implementation will be critical to avoid exacerbating existing inequalities. In the agricultural sector, for example, initiatives may seek to provide greater support to those farms that might not otherwise be able to afford new methane reducing technologies; rather than an approach that might exacerbate sectoral inequity by increasing competitive advantage of already well-resourced farming operations.

Co-benefits and trade-offs are interlinked across wellbeing domains

Many high-potential emissions reduction options deliver multiple wellbeing co-benefits, such as improved air quality, healthier lifestyles, and cultural connections to land and water. At the same time, trade-offs are present, particularly where land-use change or new infrastructure creates environmental or cultural risks. These interdependencies highlight the need for councils to consider options as part of an integrated approach, rather than in isolation. For example, supporting native afforestation provides a range of wellbeing benefits but involves higher up-front costs and, at scale, will potentially displace other more traditional land uses.

Cultural wellbeing assessment reinforces the importance of partnership

The cultural dimension of wellbeing proved more challenging to assess. While some options clearly align with principles of kaitiakitanga and Te Ao Māori values, many impacts cannot be meaningfully assessed without input from Rūnanga and mana whenua. Future engagement is essential to ensure cultural values, mātauranga Māori, and intergenerational continuity are fully embedded in decision-making. Whilst the assessment included criteria to evaluate cultural impacts beyond mana whenua, no such material impacts were identified under the cultural wellbeing theme. Impacts relating to other cultural and ethic groups, such as Pacifica, Asian or Pākehā communities have been captured through the social (health, accessibility, cost of living) and equity lenses rather than cultural.

Some of the most significant options depend on wider collaboration

The assessment shows that several high-impact options sit largely outside direct council control; for example, freight mode shift, aviation, industrial processes, and agricultural technologies. For these, councils' role is likely to be enabling, advocating, and convening rather than delivering. The success of these options would depend on active engagement and leadership from industry, central government, and community stakeholders. Building strong partnerships and amplifying local voices in national and sectoral decisions will be critical if Canterbury is to benefit from these wider transitions.

Economic impacts cannot be divorced from social and equity outcomes

While some options score strongly on economic potential, their benefits are uneven unless linked to workforce transition, skills development and affordability measures. The wellbeing assessment shows that a 'just transition' approach - ensuring workers, communities and businesses are supported through change - is critical to aligning economic and social benefits rather than setting them in tension. For example, freight mode shift to shipping and rail is likely to displace employment in the trucking industry. The shift to EVs is also likely to require skills transition and may ultimately displace some mechanic jobs as they generally require lower levels of maintenance and repair.

Urban form may be the most powerful lever within councils' control, but not is yet framed as a range of concrete initiatives

The assessment highlights that the way towns and cities are planned and designed is an influential determinant of long-term emissions. Compact, connected, and transit-oriented urban form can lock in reductions across transport, energy, and infrastructure for decades, while also supporting health, equity, and resilience. At this stage there are few options that directly address specific future urban form outcomes or objectives. While transport initiatives are present, they do not substitute for the broader role of land-use planning and urban design. The use of spatial planning frameworks, legislative regional policy planning processes and consenting levers is explicitly covered in the broad list of enablers. These can complement and reinforce the range of existing options, as well as informing future initiatives specifically designed to lock in emission reductions.

4.2 Enablers

The enablers were not assessed as part of this project because they are not currently expressed in sufficiently concrete or tangible terms to understand specific emission reduction potential or wellbeing risks and opportunities. However, their vital importance becomes clear when read alongside the assessment findings. As an initial step in this project, for which the scope and budget was slightly increased, T+T reviewed the Strategic Overview to extract those options which could be articulated in sufficiently concrete terms for assessment. At the same time, we developed the list of enablers which included what had been called *Cross sector and system changes and interventions* and other *enablers* that were mixed together with options under other themes. Some of these enablers were written in broad terms, for example:

- Working alongside industry and government.
- National goals and targets.
- A Canterbury Regional Deal.

- Carbon pricing.
- Regional Public Transport Plan.
- Regional Land Transport Plan.
- Work collectively as councils.

It is useful to have this list of broad enablers to draw from; yet it is not possible to know at this stage exactly how those enablers might or should be used. It goes without saying that, where possible and appropriate, all these enablers should be leveraged to maximise the reduction of emissions. However, exactly how that should be done will need to come through the proper decision-making processes. The ideal ways for leveraging these enablers should become much clearer as part of the stakeholder engagement work; and then be finalised as part of the next stage of work to develop actions for the regional emissions reduction plan in partnership with CCPP council members.

Some of the other enablers are more specific, for example:

- Review Good Management Practice guidelines alongside industry and Crown Research Institutes/Public Research Organisations.
- Support industry to identify what skills are needed for a successful transition, including through the Industry Skills Boards.
- Partner with stakeholders to develop local area energy plans.
- Specific advocacy to government for national policy settings to support behaviour change and mode shift.
- Support industry capability for implementing alternative F-gases (installers, maintainers, and disposal operatives).

Whether or not these more specific enablers should be addressed will very much depend upon which options CCPP council members choose to progress and submit to their LTP processes as part of developing the regional emissions reduction transition plan.

Linkages between the enablers and options assessed

The enablers provide the policy, financial, institutional, and cultural conditions that make it possible for options to succeed. For example, spatial planning frameworks, regional policy statements, and consenting processes are essential to ensure that transport, energy, and land-use initiatives are designed to lock in long-term low-emissions outcomes. Likewise, partnerships with mana whenua, industry, and research organisations ensure that cultural values, technical innovation, and local knowledge are embedded into option design. In this way, the enablers form the scaffolding around which the most powerful emissions reduction opportunities can be implemented.

The assessment also highlighted that some of the most significant options, such as electrification, industrial process heat transition, agricultural mitigation technologies, or large-scale transport mode shift, will only succeed if supported by specific enablers like investment, advocacy, regulation or incentives. These include access to finance (through levies, loans, or targeted funds), strong data and information flows, industry skills development, and coordinated governance. For instance, agricultural methane inhibitors and precision farming require both innovation partnerships and regulatory guidance; electrification and renewable energy uptake depend on national grid resilience and regional energy planning; and waste options require the development of a regional circular economy strategy. Without these enabling conditions, the risk is that high-potential options stall, or exacerbate inequities, rather than delivering the positive wellbeing outcomes identified in the assessment. Taken together, the enablers represent the bridge between the option-level findings and the eventual design of a coherent, implementable regional transition pathway.

Summary

Aligning the enablers to specific options is outside the scope of this assessment project and not particularly useful until the final design and implementation approach for options is determined. The stakeholder engagement sessions can begin to meaningfully explore which enablers are best suited to specific options, in terms of designing options that are most relevant and acceptable to those who will be affected. The final stage of work, to develop actions for the regional emissions reduction transition plan, is – in our view – the appropriate time to decide which enablers should be aligned with specific options as a core part of scoping the final set of actions for implementation.

A full list of the enablers extracted from the Strategic Overview is set out in **Appendix E**; and also listed on a separate tab of the assessment spreadsheet alongside the options extracted from the Strategic Overview.

5 Recommendations

Based on the assessment and our findings set out in this report, we make the following recommendations:

5.1 Clarify opportunities

It would be useful to sharpen the framing of some options to make them more tangible and complete for stakeholder feedback. Some options require further clarity about their scope to determine the extent of potential emissions reduction (for example, the sorts of materials to focus on for waste avoidance and re-use; and more detail about the activities intended to be covered by Good Practice Management guidelines for farms). It will also be useful to link some of the options to specific levers councils and partners could realistically apply, to explain how they are likely to be implemented (for example, through direct funding, levies, regulation or advocacy). Further clarification about the design of options will also help highlight the most relevant wellbeing risks and opportunities that may need to be addressed as part of their proposed implementation.

5.2 Fill identified gaps

The assessment has shown that some important areas that can have a significant impact on long-term emissions, such as urban form, may not yet be fully captured within the options. The assessment of cultural wellbeing risks and opportunities also needs to be complemented with input from relevant Rūnanga. We suggest these gaps be explicitly noted and that future stages of the project include mechanisms (e.g. Rūnanga and mana whenua engagement) to address them.

5.3 Position the emissions reduction assessment

When using or referring to the assessment spreadsheet, we advise being clear that the estimates of GHG reduction potential provided in the assessment spreadsheet are indicative only. They are high-level assessments, not based on detailed analysis in the particular context of their proposed implementation. Separate work has already been undertaken to develop decarbonisation pathways. We suggest noting this explicitly, and positioning the current assessment as complementary, being more specifically focused on associated wellbeing risks and opportunities related to each of the options.

5.4 Use the assessment as a platform for engagement

The next stage of the project involves stakeholder engagement. Whilst the assessment has provided a semi-quantitative assessment of wellbeing risks and opportunities, stakeholders may have their own subjective views that differ from the scores that have been recorded. The assessment has identified a wide range of issues that are relevant to each option which can usefully be used to inform discussions with stakeholders. We suggest using the assessment findings more broadly in this way - and particularly the equity lens, the role of enablers, and the systemic interconnections - as the basis for structured discussions with communities, industry, and mana whenua.

6 Applicability

This report has been prepared for the exclusive use of our client Environment Canterbury, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:



.....

Simon Harvey
Principal Consultant - Strategic Sustainability

Authorised for Tonkin & Taylor Ltd by:



.....

Peter Cochrane
Project Director

Appendix A Source documents used for assessment

Canterbury Regional Transport Committee Hearings Panel - Canterbury Regional Public Transport Plan 2025-35 Deliberations; 20th March 2025
Moving Forward Waimakariri Integrated Transport Strategy 2035
Annual Greenhouse Gas Emissions in Canterbury 2018 and 2021
ANZCO Foods 2020 Climate-Change and Sustainability Report
BERL Wate to Energy – The incineration option - 2019
Climate Change Commission Annual Report 2023 / 24
Canterbury Waste Joint Committee's report on waste data
Canterbury Energy Inventory 2025
Canterbury Energy Inventory Summary 2025
Canterbury Regional Land Transport Plan 2024-2034
Canterbury Regional Policy Statement 2013 – July 2021
Climate Change Commission Monitoring Report: Emissions Reduction July 2024 - Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target
Climate Change Commission Monitoring Report: Emissions Reduction July 2025 - Assessing progress towards meeting Aotearoa New Zealand's emissions budgets and the 2050 target
Canterbury Mayoral Forum - Submission on National direction for plantation and exotic carbon afforestation Dec 2022
Draft Canterbury Regional Public Transport Plan 2025-35
EECA Mid-South Canterbury RETA Report – June 2023
Greater Christchurch Transport Plan 2025
Green Freight Strategic Working Paper - May-2020
Ministry of Transport – Annual Report 2023/24
Ministry for the Environment - National Direction for Greenhouse Gas Emissions from Industrial Process Heat Industry Factsheet
Ngai Tahu Climate Change Strategy – August 2018
New Zealand Productivity Commission – Low Emissions Economy – August 2018

Office of the Prime Minister's Chief Science Advisor – Intern Report – International policy overview of organic waste bans to landfill – March 2024 (Megan McKenzie)
AgResearch - Reducing New Zealand's Agricultural GHGs: Methane Inhibitors – July 2017
The Agri Business Group – Report on agricultural mitigation technologies – October 2023
Regional Energy Transition Accelerator – North Canterbury Phase One Report – November 2023
Regional Energy Transition Accelerator – South Island Phase One Report – July 2024
New Zealand Agricultural Greenhouse Gas Research Centre - The science of methane - 2025
Environment Canterbury - Transport Emissions in Canterbury Summary report – June 2022
Te Rūnanga of Ngāi Tahu Te Kounga Paparangi Climate Action Plan -2024
Environment Canterbury - Tuia – Our Journey So Far
Reducing New Zealand's Livestock Methane Emissions – William Aitkenhead – 2023

Appendix B Prompts used for the GPT assessment model

Prompt for Uploading the Excel Assessment Spreadsheet:

You're working with an assessment framework to evaluate 52 decarbonisation **options** across two broad areas:

1 Decarbonisation impact (GHG reduction potential and feasibility).

2 Consequential impacts across five domains – *Environmental, Social, Cultural, Economic,* and *Equity.*

I'm uploading our decarbonisation assessment spreadsheet. It contains 52 options and detailed scoring criteria across GHG impact and five wellbeing domains (environmental, social, cultural, economic, and equity).

Read the spreadsheet and confirm you understand the structure and how scoring, scope and commentary fields are to be used. I'd then like to work through the options one at a time, asking you to assess them based on the framework.

For the assessments, only use the scoring criteria set out in the spreadsheet to ensure consistency.

Prompt for Uploading Source Documents

I will upload a set of documents to be used as key reference material for assessing decarbonisation options and their wider wellbeing and equity impacts. Please read all uploaded documents carefully and index them so you can extract specific information as needed. Use these documents as the **primary evidence base**.

When answering questions or doing the assessments, **always cite from these documents first**, and then use online sources to verify, complement or add to this this information when:

- the uploaded documents don't contain relevant or complete information.
- further clarification is needed, or
- the issue is time-sensitive and may have changed recently.
- More up to date information is available that in the source documents.

When using internet sources, stick to authoritative and up-to-date materials (e.g. from MBIE, MfE, EECA, Stats NZ, Climate Change Commission, Te Uru Rākau, and other reputable research).

Confirm once you've fully read the documents and can begin using them in assessments and analysis.

If helpful, group and tag the documents by theme (e.g. transport, industrial heat, agriculture, energy, policy, adaptation) so they can be retrieved faster when referenced in assessments.

Prompt:
Return the above assessment as a table or structured bulleted list, matching the spreadsheet columns (score, scope, and rationale).

Greenhouse gas emissions assessment

Prompt:
Assess the decarbonisation potential of this option: [insert option name, e.g. "Low-emissions livestock breeding"].
Use these criteria and score using the drop-down list criteria, with commentary:

- Scale of potential GHG reduction.
- Likelihood of achieving that level of decarbonisation.
- Time to achieve decarbonisation.
- Time to implement the initiative.
- Measurability of the impact.
- Level of local council control.
- Alignment with existing council strategies

Also summarise any uncertainties, barriers, co-benefits, and dependencies.
Reference any sources used.

Environmental Impact Prompt

Prompt:
Assess the environmental impact of this option: [insert option name].
Assess the option for consequential impacts in the following areas. Score the overall environmental impact from -5 to +5 to reflect both negative and positive impacts, with commentary to explain the reasons for the score with reference to the consequential environmental impacts:
The consequential impacts to assess are:

- Biodiversity protection or risk
- Habitat disruption and restoration
- Climate resilience of ecosystems
- Resource use (land, water, minerals)
- Air and water quality
- Non-GHG polluting emissions

Include:

- Overall environmental score (−5 to +5)
- Scope of impact (Local, Regional, National, Global)
- Barriers, assumptions, risks
- Unique systemic relationships or cascading impacts (positive or negative)
- Any uncertainties or unknowns
- Any other reasons for qualifying the score

Social Impact Prompt

Prompt:

Assess the social impact of this option: [insert option name].

Assess the option for consequential impacts in the following areas. Score the overall social impact from -5 to +5 to reflect both negative and positive impacts, with commentary to explain the reasons for the score with reference to the consequential social impacts:

The consequential impacts to assess are:

- Health
- Safety
- Accessibility to services
- Mobility
- Political voice and democratic participation
- Community cohesion and social connection
- Cost of living and energy affordability
- Opportunities for work and income
- Disruption or benefit to daily life

Include:

- Overall social score (−5 to +5)
- Scope of impact (Local, Regional, National, Global)
- Assumptions, uncertainties, systemic effects
- Identify at-risk or especially impacted groups

Cultural Impact Prompt

Prompt:

Assess the cultural impact of this option: [insert option name].

Assess the option for consequential impacts in the following areas. Score the overall cultural impact from -5 to +5 to reflect both negative and positive impacts, with commentary to explain the reasons for the score with reference to the consequential cultural impacts:

The consequential impacts to assess are:

- Protection or enhancement of mātauranga Māori.
- Access to culturally important sites, practices, or landscapes.
- Indigenous values alignment (e.g., kaitiakitanga, whakapapa).
- Risk of cultural loss or erosion.
- Intergenerational knowledge and cultural practices including mahinga kai, mana motuhake, marae, urupa, wahi tapu and other cultural sites.
- Inclusion in planning and decision-making.

Include:

- Overall cultural score (−5 to +5).
- Scope of impact.
- Assumptions and uncertainties.
- Any iwi/hapū engagement or relevance.

Equity Impact Prompt

Prompt:

Assess the equity implications of this option: [insert option name].

Assess the option for consequential impacts in the following areas. Score the overall consequential equity impact from −5 (entrenches inequity) to +5 (greatly improves equity), with commentary to explain the reasons for the score with reference to the consequential equity impacts:

The consequential impacts to assess are:

- distribution of costs, benefits and choice burdens.
- intergenerational fairness.
- barriers to participation (including cost, location and accessibility).
- risk of reinforcing disadvantage.

Include:

- Overall environmental score (−5 to +5).
- Scope of impact (Local, Regional, National, Global).
- Barriers, assumptions, risks.
- Unique systemic relationships or cascading impacts (positive or negative).
- Any uncertainties or unknowns.
- Any other reasons for qualifying the score.

Include in the commentary:

- Who benefits or is burdened.
- Distributional effects across demographic, regional, and income groups.
- Barriers to participation (e.g., financial, technical, cultural).
- Opportunity to reduce or worsen inequities.
- Commentary on fairness, justice, and social acceptability.
- Identify specific vulnerable or marginalised groups affected.

Economic Impact Prompt

Prompt:

Assess the economic impact of this option: [insert option name].

Use the following impact areas. Score each from -5 to +5 to reflect both negative and positive impacts, with commentary:

- Investment required and capital access.
- Economic risk or opportunity for affected industries and sector specific competitiveness.
- Job creation or loss and any transition support.
- Local vs national value chain impact.
- Innovation or diversification benefits.
- Long term economic returns vs short term costs.

Include:

- Overall economic score (−5 to +5).
- Scope of economic impact.
- Risks, assumptions, and uncertainties.

Appendix C Full list of options in order of wellbeing assessment scores

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage.	High	Medium (3-10 years)	Short (1-3 years)	High	38.4%	**1**
Agriculture, forestry and other land use	Support native afforestation and natural regeneration across the region, including restoring wetlands and indigenous biodiversity.	Moderate	Long (10+ years)	Short (1-3 years)	High	37.6%	**2**
Waste	Partner with small enterprises to establish community refurbishment schemes.	Very low	Medium (3-10 years)	Short (1-3 years)	Medium	36.0%	**3**
Waste	Support waste avoidance with re-use and repurposing of resources (e.g. through for-purpose organisations)	Low	Medium (3-10 years)	Short (1-3 years)	Medium	36.0%	**3**
Agriculture, forestry and other land use	Promote use of farm advisory services.	Moderate	Medium (3-10 years)	Short (1-3 years)	High	33.6%	**5**
Transport	Promote active travel (cycling, scootering and walking) for urban areas.	Moderate	Medium (3-10 years)	Short (1-3 years)	Medium	33.6%	**5**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Transport	Support rural digital connectivity that reduces need for travel.	Low	Medium (3-10 years)	Medium (3-10 years)	Low	32.0%	**7**
Transport	Increase support for bus or carpooling options for travel to schools.	Moderate	Short (1-3 years)	Short (1-3 years)	High	31.2%	**8**
Energy	Partner collectively and / or with EECA to increase investment in energy efficiency and low emission heating sources in houses, commercial and industrial buildings.	High	Medium (3-10 years)	Short (1-3 years)	Medium	29.6%	**9**
Waste	Re-use of aggregates for construction.	Low	Short (1-3 years)	Short (1-3 years)	Medium	29.6%	**9**
Agriculture, forestry and other land use	Support coordinated regional planning to align and balance the availability of local supplementary cattle feed with the volume of cattle farming.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	28.0%	**11**
Waste	Waste separation at source to divert organic waste from landfill.	Moderate	Medium (3-10 years)	Medium (3-10 years)	High	28.0%	**11**
Transport	Support a mass rapid transit system for Greater Christchurch.	Moderate	Long (10+ years)	Long (10+ years)	Medium	27.2%	**13**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Waste	Review councils' procurement processes and contracts to encourage waste management companies to invest more in infrastructure and assets that improve collection and disposal while reducing emissions.	Low	Medium (3-10 years)	Short (1-3 years)	High	26.4%	**14**
Energy	Promote or financially support distributed energy generation, most obviously through support for an uptake in solar panels for households, commercial and industrial buildings.	Moderate	Medium (3-10 years)	Short (1-3 years)	Medium	26.4%	**14**
Transport	Region-wide workplace and school travel planning service (targeting places with the largest travel needs and likelihood of success).	Low	Short (1-3 years)	Short (1-3 years)	High	26.4%	**14**
Energy	Support Carbon Neutral Government Programme here (noting that schools and hospitals are some of the larger sources of emissions in the region - as per CCPP Action 2 Strategic Overview).	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	24.0%	**17**
Transport	Electrify entire bus fleet.	Moderate	Medium (3-10 years)	Medium (3-10 years)	High	24.0%	**17**
Transport	Enable the local bioenergy sector to provide second generation biofuels for aviation and shipping (e.g., Sustainable Aviation Fuels from waste products).	Moderate	Long (10+ years)	Long (10+ years)	Low	22.4%	**19**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Energy	Raise understanding and help facilitate increased use of biogas for industrial process heat.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	20.8%	**20**
Transport	Support a blue / green hydrogen industry to provide fuels for heavy vehicles and aviation.	Moderate	Long (10+ years)	Long (10+ years)	Low	20.0%	**21**
Transport	Increase support for EV car-share vehicle trusts.	Low	Medium (3-10 years)	Short (1-3 years)	Medium	20.0%	**21**
Agriculture, forestry and other land use	Promote incorporation of GHG reductions into Good Management Practice guidelines and enforce through consent condition.	Moderate	Medium (3-10 years)	Medium (3-10 years)	High	20.0%	**21**
Transport	Support on-demand public transport services (like MyWay).	Low	Short (1-3 years)	Short (1-3 years)	High	19.2%	**24**
Transport	Use spatial planning and other transport planning levers– e.g. zoning / corridors to reduce carbon emissions and encourage freight route optimisation.	Low	Long (10+ years)	Medium (3-10 years)	Medium	19.2%	**24**
Waste	Energy recovery from methane gas capture from landfill.	High	Medium (3-10 years)	Short (1-3 years)	High	18.4%	**26**
Transport	Integrated land-use and transport planning - transit oriented developments in towns and cities.	Low	Long (10+ years)	Long (10+ years)	Medium	17.6%	**27**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Energy	Support development of large-scale Battery Energy Storage Systems.	High	Medium (3-10 years)	Short (1-3 years)	Medium	16.8%	**28**
Energy	Support district scheme energy and heat networks (provided renewables available locally, like geothermal / waste from energy) for industrial / housing developments.	Moderate	Short (1-3 years)	Medium (3-10 years)	Medium	16.8%	**28**
Waste	Container deposit return scheme.	Very low	Medium (3-10 years)	Short (1-3 years)	Medium	16.8%	**28**
Agriculture, forestry and other land use	Promote low-emissions livestock breeding programmes.	Moderate	Long (10+ years)	Short (1-3 years)	Low	16.8%	**28**
Energy	Support development of large-scale solar farms.	High	Short (1-3 years)	Medium (3-10 years)	Medium	16.0%	**32**
Agriculture, forestry and other land use	Promote precision agriculture technologies.	Moderate	Short (1-3 years)	Short (1-3 years)	Low	16.0%	**32**
Transport	Promote and support the Regional Transport Committee's work to enable freight mode shift to shipping and rail (see RLTP for initiatives).	Significant	Long (10+ years)	Medium (3-10 years)	Low	16.0%	**32**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Industrial process and produce use	Promote responsible disposal management of fluorinated GHGs through recovery, reclamation, recycling and destruction.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	15.2%	**35**
Transport	Enable wider electric bus fleet uptake by providing high-capacity charging infrastructure.	Moderate	Short (1-3 years)	Short (1-3 years)	Medium	15.2%	**35**
Transport	Support the decarbonisation of ports and airports (operational and transport related).	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	14.4%	**37**
Energy	Raise understanding and help facilitate increased use of electric boilers for industrial process heat.	High	Medium (3-10 years)	Short (1-3 years)	Medium	13.6%	**38**
Waste	Anaerobic digester facilities that make biogas and fertilizers from organic waste, including manure, food waste, crop residues, crop waste and wastewater sewage.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	12.8%	**39**
Transport	Promote existing funding and financing options to decarbonise light and heavy vehicles.	High	Long (10+ years)	Short (1-3 years)	Medium	12.8%	**39**
Transport	Support and encourage installation of EV charging infrastructure for cars and trucks through the region.	Moderate	Medium (3-10 years)	Short (1-3 years)	Low	12.8%	**39**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Industrial process and produce use	Co-develop fluorinated GHG waste handling facility with industry.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	12.0%	**42**
Industrial process and produce use	Support increased adoption of low-emission fluorinated GHG alternatives.	Moderate	Medium (3-10 years)	Short (1-3 years)	Medium	12.0%	**42**
Energy	Support industrial process heat users through the consent application process and with developing emissions reduction plans; and ensure the consenting process is smooth and efficient.	Moderate	Medium (3-10 years)	Short (1-3 years)	High	11.2%	**44**
Transport	Use regulatory levers to encourage uptake of low-emissions vehicles.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	11.2%	**44**
Energy	Promote alignment with voluntary energy efficiency certification systems for buildings through councils' advisory, planning and consenting processes.	Low	Medium (3-10 years)	Short (1-3 years)	Medium	11.2%	**44**
Agriculture, forestry and other land use	Support innovation and uptake of methane inhibitors and methane vaccines.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	9.6%	**47**
Transport	Encourage the uptake of electric cars / light-vehicles (e.g., promotional events and funding).	Low	Medium (3-10 years)	Short (1-3 years)	Medium	9.6%	**47**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Energy	Promote on-site energy generation on construction sites.	Low	Short (1-3 years)	Short (1-3 years)	Medium	8.0%	**49**
Agriculture, forestry and other land use	Promote methane capture from manure in farm slurry pits.	Low	Medium (3-10 years)	Medium (3-10 years)	Medium	8.0%	**49**
Industrial process and produce use	Support and incentivise initiatives that prevent leakage of Fluorinated GHG gases from refrigeration systems.	Moderate	Medium (3-10 years)	Short (1-3 years)	Medium	7.2%	**51**
Agriculture, forestry and other land use	Support exotic and plantation afforestation.	Moderate	Long (10+ years)	Short (1-3 years)	Low	3.2%	**52**
Transport	Promote active travel for rural areas.	Very low	Long (10+ years)	Medium (3-10 years)	Medium	3.2%	**52**
Energy	Raise understanding and help facilitate increased use of biomass for industrial process heat.	High	Medium (3-10 years)	Medium (3-10 years)	High	0.8%	**54**

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total wellbeing scores (weighted and normalized as %)	Rank
Transport	Explore pricing mechanisms (e.g., regional fuel tax, congestion charging or parking fees) to influence travel behaviours and help fund transport decarbonisation (e.g., public transport enhancements).	Low	Medium (3-10 years)	Medium (3-10 years)	Medium	-3.2%	**55**
Industrial process and produce use	Prohibit use of fluorinated GHGs through planning and consenting levers.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Medium	-6.4%	**56**
Agriculture, forestry and other land use	Promote supplementary livestock feeds that lower emissions.	Moderate	Medium (3-10 years)	Medium (3-10 years)	Low	-6.4%	**56**

Appendix D Full list of options in order of scale of potential GHG reduction

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Transport	Promote and support the Regional Transport Committee's work to enable freight mode shift to shipping and rail (see RLTP for initiatives).	Significant	Long (10+ years)	Medium (3-10 years)	Low	16.0%	32
Transport	Increase frequency, reliability, service levels and customer experience on public transport to increase patronage.	High	Medium (3-10 years)	Short (1-3 years)	High	38.4%	1
Energy	Partner collectively and / or with EECA to increase investment in energy efficiency and low emission heating sources in houses, commercial and industrial buildings.	High	Medium (3-10 years)	Short (1-3 years)	Medium	29.6%	9
Waste	Energy recovery from methane gas capture from landfill.	High	Medium (3-10 years)	Short (1-3 years)	High	18.4%	26

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Energy	Support development of large-scale Battery Energy Storage Systems.	High	Medium (3-10 years)	Short (1-3 years)	Medium	16.8%	28
Energy	Support development of large-scale solar farms.	High	Short (1-3 years)	Medium (3-10 years)	Medium	16.0%	32
Energy	Raise understanding and help facilitate increased use of electric boilers for industrial process heat.	High	Medium (3-10 years)	Short (1-3 years)	Medium	13.6%	38
Waste	Anaerobic digester facilities that make biogas and fertilizers from organic waste, including manure, food waste, crop residues, crop waste and wastewater sewage.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	12.8%	39
Transport	Promote existing funding and financing options to decarbonise light and heavy vehicles.	High	Long (10+ years)	Short (1-3 years)	Medium	12.8%	39
Transport	Use regulatory levers to encourage uptake of low-emissions vehicles.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	11.2%	44

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Agriculture, forestry and other land use	Support innovation and uptake of methane inhibitors and methane vaccines.	High	Medium (3-10 years)	Medium (3-10 years)	Medium	9.6%	47
Energy	Raise understanding and help facilitate increased use of biomass for industrial process heat.	High	Medium (3-10 years)	Medium (3-10 years)	High	0.8%	54
Agriculture, forestry and other land use	Support native afforestation and natural regeneration across the region, including restoring wetlands and indigenous biodiversity	**Moderate**	Long (10+ years)	Short (1-3 years)	High	37.6%	2
Agriculture, forestry and other land use	Promote use of farm advisory services	**Moderate**	Medium (3-10 years)	Short (1-3 years)	High	33.6%	5
Transport	Promote active travel (cycling, scootering and walking) for urban areas	**Moderate**	Medium (3-10 years)	Short (1-3 years)	Medium	33.6%	5
Transport	Increase support for bus or carpooling options for travel to schools	**Moderate**	Short (1-3 years)	Short (1-3 years)	High	31.2%	8

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Agriculture, forestry and other land use	Support coordinated regional planning to align and balance the availability of local supplementary cattle feed with the volume of cattle farming	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	28.0%	11
Waste	Waste separation at source to divert organic waste from landfill.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	High	28.0%	11
Transport	Support a mass rapid transit system for Greater Christchurch	**Moderate**	Long (10+ years)	Long (10+ years)	Medium	27.2%	13
Energy	Promote or financially support distributed energy generation, most obviously through support for an uptake in solar panels for households, commercial and industrial buildings	**Moderate**	Medium (3-10 years)	Short (1-3 years)	Medium	26.4%	14
Energy	Support Carbon Neutral Government Programme here (noting that schools and hospitals are some of the larger sources of emissions in the region - as	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	24.0%	17

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
	per CCPP Action 2 Strategic Overview)						
Transport	Electrify entire bus fleet	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	High	24.0%	17
Transport	Enable the local bioenergy sector to provide second generation biofuels for aviation and shipping (e.g., Sustainable Aviation Fuels from waste products).	**Moderate**	Long (10+ years)	Long (10+ years)	Low	22.4%	19
Energy	Raise understanding and help facilitate increased use of biogas for industrial process heat	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	20.8%	20
Transport	Support a blue / green hydrogen industry to provide fuels for heavy vehicles and aviation	**Moderate**	Long (10+ years)	Long (10+ years)	Low	20.0%	21
Agriculture, forestry and other land use	Promote incorporation of GHG reductions into Good Management Practice guidelines and enforce through consent condition.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	High	20.0%	21

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Energy	Support district scheme energy and heat networks (provided renewables available locally, like geothermal / waste from energy) for industrial / housing developments.	**Moderate**	Short (1-3 years)	Medium (3-10 years)	Medium	16.8%	28
Agriculture, forestry and other land use	Promote low-emissions livestock breeding programmes.	**Moderate**	Long (10+ years)	Short (1-3 years)	Low	16.8%	28
Agriculture, forestry and other land use	Promote precision agriculture technologies.	**Moderate**	Short (1-3 years)	Short (1-3 years)	Low	16.0%	32
Industrial process and produce use	Promote responsible disposal management of fluorinated GHGs through recovery, reclamation, recycling and destruction.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	15.2%	35
Transport	Enable wider electric bus fleet uptake by providing high-capacity charging infrastructure.	**Moderate**	Short (1-3 years)	Short (1-3 years)	Medium	15.2%	35

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Transport	Support the decarbonisation of ports and airports (operational and transport related).	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	14.4%	37
Transport	Support and encourage installation of EV charging infrastructure for cars and trucks through the region.	**Moderate**	Medium (3-10 years)	Short (1-3 years)	Low	12.8%	39
Industrial process and produce use	Co-develop fluorinated GHG waste handling facility with industry.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	12.0%	42
Industrial process and produce use	Support increased adoption of low-emission fluorinated GHG alternatives.	**Moderate**	Medium (3-10 years)	Short (1-3 years)	Medium	12.0%	42
Energy	Support industrial process heat users through the consent application process and with developing emissions reduction plans; and ensure the consenting process is smooth and efficient.	**Moderate**	Medium (3-10 years)	Short (1-3 years)	High	11.2%	44

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Industrial process and produce use	Support and incentivise initiatives that prevent leakage of fluorinated GHG gases from refrigeration systems.	**Moderate**	Medium (3-10 years)	Short (1-3 years)	Medium	7.2%	51
Agriculture, forestry and other land use	Support exotic and plantation afforestation.	**Moderate**	Long (10+ years)	Short (1-3 years)	Low	3.2%	52
Industrial process and produce use	Prohibit use of fluorinated GHGs through planning and consenting levers.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Medium	-6.4%	56
Agriculture, forestry and other land use	Promote supplementary livestock feeds that lower emissions.	**Moderate**	Medium (3-10 years)	Medium (3-10 years)	Low	-6.4%	56
Waste	Support waste avoidance with re-use and repurposing of resources (e.g. through for-purpose organisations).	**Low**	Medium (3-10 years)	Short (1-3 years)	Medium	36.0%	3
Transport	Support rural digital connectivity that reduces need for travel.	**Low**	Medium (3-10 years)	Medium (3-10 years)	Low	32.0%	7

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Waste	Re-use of aggregates for construction.	**Low**	Short (1-3 years)	Short (1-3 years)	Medium	29.6%	9
Waste	Review councils' procurement processes and contracts to encourage waste management companies to invest more in infrastructure and assets that improve collection and disposal while reducing emissions.	**Low**	Medium (3-10 years)	Short (1-3 years)	High	26.4%	14
Transport	Region-wide workplace and school travel planning service (targeting places with the largest travel needs and likelihood of success).	**Low**	Short (1-3 years)	Short (1-3 years)	High	26.4%	14
Transport	Increase support for EV car-share vehicle trusts.	**Low**	Medium (3-10 years)	Short (1-3 years)	Medium	20.0%	21
Transport	Support on-demand public transport services (like MyWay).	**Low**	Short (1-3 years)	Short (1-3 years)	High	19.2%	24

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Transport	Use spatial planning and other transport planning levers– e.g. zoning / corridors to reduce carbon emissions and encourage freight route optimisation.	**Low**	Long (10+ years)	Medium (3-10 years)	Medium	19.2%	24
Transport	Integrated land-use and transport planning - transit oriented developments in towns and cities.	**Low**	Long (10+ years)	Long (10+ years)	Medium	17.6%	27
Agriculture, forestry and other land use	Promote methane capture from manure in farm slurry pits.	**Low**	Medium (3-10 years)	Medium (3-10 years)	Medium	8.0%	49
Energy	Promote alignment with voluntary energy efficiency certification systems for buildings through councils' advisory, planning and consenting processes.	**Low**	Medium (3-10 years)	Short (1-3 years)	Medium	11.2%	44
Transport	Encourage the uptake of electric cars / light-vehicles (e.g., promotional events and funding).	**Low**	Medium (3-10 years)	Short (1-3 years)	Medium	9.6%	47

Opportunity area	GHG reduction opportunity	Scale of potential GHG reduction	Time to material impact (years)	Lead time to implement (years)	Level of council influence over GHG reduction initiative	Total (weighted and normalized as %)	Rank
Energy	Promote on-site energy generation on construction sites.	**Low**	Short (1-3 years)	Short (1-3 years)	Medium	8.0%	49
Transport	Explore pricing mechanisms (e.g., regional fuel tax, congestion charging or parking fees) to influence travel behaviours and help fund transport decarbonisation (e.g., public transport enhancements).	**Low**	Medium (3-10 years)	Medium (3-10 years)	Medium	-3.2%	55
Waste	Partner with small enterprises to establish community refurbishment schemes.	**Very low**	Medium (3-10 years)	Short (1-3 years)	Medium	36.0%	3
Waste	Container deposit return scheme.	**Very low**	Medium (3-10 years)	Short (1-3 years)	Medium	16.8%	28
Transport	Promote active travel for rural areas.	**Very low**	Long (10+ years)	Medium (3-10 years)	Medium	3.2%	52

Appendix E Enablers extracted from the Strategic Overview document

Category	Enablers
Advocacy to government and other stakeholders	• Build stronger relationships with government to advocate for and influence low-emissions policy settings aligned with a just transition. • Working with government, industry and others. • Align initiatives with government policy, particularly: – partnering with the government on afforestation and carbon sink opportunities – making greater use of the Waste Minimisation Fund. • Specific advocacy on: National energy strategy / action plan Energy efficiency in homes and businesses Carbon pricing Prohibition / phase out of gas appliances. • Promote existing funding and financing available. • Specific advocacy to government for national policy settings to support behaviour change and mode shift. • National goals and targets.
Planning, consenting and urban form	• Develop spatial planning frameworks designed to encourage and enable GHG reductions and more sustainable living. • Shape regional planning to support and maximise reduction of GHGs, including: – Regional Policy Statement. – Regional Public Transport. – Plan Regional Land Transport Plan. • Ensure planning and consenting processes enable the adoption of low-emissions technology and infrastructure; and enable the transition to more sustainable living. • Improve pre-application support to help applicants understand what is required for consents with GHG discharges. • Develop lists of pre-approved and priority technologies. • Work with industry and EECA to ensure sufficient guidance and support available for consent applications. • Work with other councils to ensure an agreed approach for determining who meets criteria for a 'Suitably Qualified Person' to provide more consistency in assessment. • Support smaller businesses to access funding or finance to develop emissions reductions plan for consents. • Planning and consenting regime.

Category	Enablers
Funding and finance	• Leverage council investment priorities, levies and funding to support businesses and communities through the transition. • Promote the availability of funding and financing opportunities from public and private sources. – LGFA Green, Social and Sustainable Loans – LGFA Climate Action loans – Regional Infrastructure Fund (outside CHCH city only) – Regional deals – Climate levy – Targeted rate – Sale of NZU carbon credits. • Borrow against NZU carbon credits. • LGFA loans (low-emissions, energy efficient homes and buildings, supporting innovation and sustainable production in the primary industries and afforestation, and transport mode shift). • Regional deals to support large scale energy supply (Canterbury Regional Deal). • Provide direct funding.
Data, information and skills	• Improve the supply and communication of relevant and reliable information to enable communities and business to access useful and timely advice, funding, research and solutions. • Support industry to identify what skills are needed for a successful transition, including through new Industry Skills Boards. • Work with government and industry to improve emissions data collection and management, with a focus on agriculture and waste-related greenhouse gas emissions. • Improve data accuracy, completeness and management.
Technology and innovation	• Support or partner with industry to drive innovation in inhibitor research and practice. • Review Good Management Practice guidelines alongside industry and Crown Research Institutes/Public Research Organisations. • Use technology as an enabler. • Lead or support a feasibility study.
Energy and emissions reduction transition support	• Co-invest and work with government and industry to support electrification and uptake of other renewable energy options, including by ensuring improved national grid resilience to encourage electrification, support more renewable energy generation, enable distributed storage and demand flexibility, and mitigate the need for fossil-fuel back-up generation. • Support energy users to make well-informed decisions about energy choices.

Tonkin+Taylor

Together we create + sustain a better world