



# AGENDA

## Environmental Services Committee Meeting Tuesday, 2 May 2023

**Date** Tuesday, 2 May 2023

**Time** 10.00am

**Location** Council Chamber  
District Council Building  
King George Place  
Timaru

**File Reference** 1571767

## **Timaru District Council**

**Notice is hereby given that a meeting of the Environmental Services Committee will be held in the Council Chamber, District Council Building, King George Place, Timaru, on Tuesday 2 May 2023, at 10.00am.**

### **Environmental Services Committee Members**

Clr Michelle Pye (Chairperson), Clr Owen Jackson (Deputy Chairperson), Clr Sally Parker, Clr Gavin Oliver, Clr Stu Piddington, Clr Allan Booth, Clr Peter Burt, Tewera King (Mana Whenua), Clr Stacey Scott, Clr Scott Shannon and Mayor Nigel Bowen

Quorum – no less than 5 members

### **Local Authorities (Members' Interests) Act 1968**

Committee members are reminded that if you have a pecuniary interest in any item on the agenda, then you must declare this interest and refrain from discussing or voting on this item, and are advised to withdraw from the meeting table.

Paul Cooper

**Group Manager Environmental Services**

**Order Of Business**

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- 1 Apologies**
- 2 Identification of Items of Urgent Business**
- 3 Identification of Matters of a Minor Nature**
- 4 Declaration of Conflicts of Interest**
- 5 Chairperson's Report**

**6 Confirmation of Minutes**

**6.1 Minutes of the Environmental Services Committee Meeting held on 14 March 2023**

**Author:** Jessica Kavanaugh, Governance Advisor

**Recommendation**

That the Minutes of the Environmental Services Committee Meeting held on 14 March 2023 be confirmed as a true and correct record of that meeting and that the Chairperson's electronic signature be attached.

**Attachments**

- 1. Minutes of the Environmental Services Committee Meeting held on 14 March 2023**



# MINUTES

## Environmental Services Committee Meeting Tuesday, 14 March 2023

Ref: 1571767

**Minutes of Timaru District Council  
Environmental Services Committee Meeting  
Held in the Council Chamber, District Council Building, King George Place, Timaru  
on Tuesday, 14 March 2023 at 10.00am**

**Present:** Clr Michelle Pye (Chairperson), Clr Owen Jackson (Deputy Chairperson), Clr Sally Parker, Clr Stu Piddington, Clr Allan Booth, Clr Peter Burt, Clr Stacey Scott, Clr Scott Shannon, Mayor Nigel Bowen

**In Attendance:** **Community Board Members:** Nicola Nimo (Temuka Community Board), Ross Munro (Pleasant Point Community Board), Rosie Woods (Geraldine Community Board)

**Officers:** Bede Carran (Chief Executive), Paul Cooper (Group Manager Environmental Services), Jason Rivett (Acting Group Manager Commercial & Strategy), Nigel Ingram (Group Manager Recreation and Cultural Services), Andrew Dixon (Group Manager Infrastructure), Beth Stewart-Wright (Director User Experience & Community Engagement), Erik Barnes (Acting Group Manager Recreation & Cultural Services), Stephen Doran (Communications Manager), Nicole Timney (Manager of Property Services and Client Representative), Susannah Ratahi (Land Transport Manager), Hamish Barrell (District Planning Manager), Megan Geng (Team Leader Policy), Grant Hall (Drainage & Water Manager), Samantha Molyneux (Group Coordinator Recreation & Cultural Services), Jo Williams (Executive Assistant Infrastructure), Jess Hurst (Governance and Executive Support Coordinator), Jessica Kavanaugh (Governance Advisor)

## **1 Apologies**

### **1.1 Apologies Received**

#### **Resolution 2023/5**

Moved: Mayor Nigel Bowen

Seconded: Clr Allan Booth

That the apology of Clr Gavin Oliver be received and accepted.

**Carried**

## **2 Identification of Items of Urgent Business**

No items of urgent business were received.

## **3 Identification of Matters of a Minor Nature**

No matters of a minor nature were raised.



#### **4 Declaration of Conflicts of Interest**

No conflicts of interest were declared.

#### **5 Chairperson's Report**

##### **5.1 Presentation of Chairperson's Report**

##### **Resolution 2023/6**

Moved: Clr Michelle Pye

Seconded: Deputy Chairperson Owen Jackson

The Chairperson has attended a number of meetings including; Menacing Dog Hearing, Meeting with members of the public to discuss District Plan, Domestic Food resilience workshop, Local Alcohol Policy training workshop, Pleasant Point Lions, Orari Temuka Opihi Pareora Water Zone Committee, Climate Change Action Planning reference group, Low Emission transport workshop, Making Good Decisions Foundation Course, Regional Energy Transformation Accelerator Meeting, Water Supply resiliency workshop.

**Carried**

#### **6 Confirmation of Minutes**

##### **6.1 Minutes of the Environmental Services Committee Meeting held on 31 January 2023**

##### **Resolution 2023/7**

Moved: Clr Scott Shannon

Seconded: Mayor Nigel Bowen

That the Minutes of the Environmental Services Committee Meeting held on 31 January 2023 be confirmed as a true and correct record of that meeting and that the Chairperson's electronic signature be attached.

**Carried**

#### **7 Reports**

##### **7.1 District Plan Brief on Timaru District Council Submissions on the Proposed District Plan**

The District Planning Manager and Team Leader Policy spoke to the report to brief the Environmental Services Committee on the Council submission made to the Proposed Timaru District Plan during the first formal consultation in the statutory process of the review.

The Committee also discussed the wording around 3 waters and the unknowns around this area including the ability to withdraw a submission and the Councils submission goes through the same hearings process.

**Resolution 2023/8**

Moved: Mayor Nigel Bowen

Seconded: Clr Peter Burt

That the report bringing the Timaru District Council Submission to the Proposed District Plan to the attention of the Environmental Services Committee be received and noted.

**Carried**

**8 Consideration of Urgent Business Items**

No items of urgent business were received.

**9 Consideration of Minor Nature Matters**

No matters of a minor nature were raised.

**The Meeting closed at 10.17am.**

.....  
**Clr Michelle Pye**  
**Chairperson**

## 7 Reports

### 7.1 Timaru District Climate Change Strategy Update and Next Steps

**Author:** Rhys Taylor, Climate Change Advisor  
Troy Titheridge, Climate and Strategic Projects Intern

**Authoriser:** Andrew Dixon, Group Manager Infrastructure

#### Recommendation

That the Environmental Services Committee:

1. Receive and note the Draft Timaru District Climate Change Strategy and endorse it for wider publication.
2. Acknowledge the valuable voluntary contributions of councillors, the Advisory Committee and many participants in the eight public workshops.
3. Note that a further report and action plan on recommendations distilled from the Draft Timaru District Climate Change Strategy that are relevant to Council activities will be presented at the July meeting.
4. Support, in principle, preparations to create a Trust or similar entity, outside Council, to take forward aspects of the Draft Timaru District Climate Change Strategy that are of concern to the community but may not be central to District Council statutory functions.
5. That Council officers investigate the feasibility and method of creation of such an entity, identifying potential stakeholders and funding.

#### Purpose of Report

- 1 This report is to present the First Timaru District Climate Change Strategy (TDCCS), Attachment 1, which has been created by an independent facilitator, Dr Phil Diver, after extensive public engagement and workshops.

#### Assessment of Significance

- 2 This matter is assessed as being of low - medium significance in terms of the Timaru District Council Significance and Engagement Policy as it is consistent with Long Term Plan outcomes. However, there is a high community interest and input into the TDCCS from the community, and potential impact on future wellbeing, particularly on younger generations.

#### Background

- 3 The impacts of climate change in the Timaru District are accelerating, as humanity fails to reduce global greenhouse gas emissions. In NZ, no one agency is legislatively responsible for taking a lead on climate change. In this legislative vacuum, and guided by Long Term Plan commitment to take action on climate change, TDC chose in 2022 to step up and be the local climate change leader by commissioning the development of the Timaru District Climate Change Strategy (TDCCS).

- 4 In June 2022 as part of the Long Term Plan process, Council agreed to develop a Timaru District Climate Change Strategy with the aim to ensure the TDCCS reflected the community's views on climate action throughout the Timaru District.
- 5 Dr Phil Driver, a professional engineer and internationally recognised expert in strategy-making, was engaged to be an independent facilitator to lead the TDCCS process. This process was supported by Council's Climate Change Officers.
- 6 In October 2022, Dr Driver delivered a progress report to Council on the work achieved on the TDCCS and indicated strong community momentum for continuing the strategy process.
- 7 Through to March 2023, the community and District stakeholders have voluntarily contributed over 1,500 hours to the development of the strategy through interviews and extensive public workshops advertised via newspaper and social media. In addition to this, an Advisory Group of 24 informed citizens, including the Mayor and the Chair of the Environmental Services Committee, have guided the process, establishing principles and discussing the evidence gathered.
- 8 An additional sub-strategy will be added later in the year, following a scheduled meeting on 5 July 2023 with the farming industry representatives.
- 9 Many potential actions have been identified as a result of the workshops held and key recommendations for our District have been distilled. Some of these actions Timaru District Council can potentially lead and are currently being reviewed by Council Officers, and when completed will be presented the Environmental Services Committee.

### Discussion

- 10 The TDCCS (Attachment 1) has been produced through an initial series of interviews followed by an extensive public engagement workshops process in 2022-2023.
- 11 This TDCCS represents the community views offered, including a distillation of facts on global climate change and consideration of likely local impacts. Dr Driver is presenting this work as independent reference material on which the District Council and many other stakeholders may wish and need to act.
- 12 Report author, Dr Phil Driver will be presenting to the Environment Services Committee on the report contents. This presentation will cover:
  - (i) The key issues and recommendations, which are being made to all community stakeholders, not only to the Timaru District Council
  - (ii) Note most people's limited willingness to take decisive action on climate change, largely due to incomplete understandings of climate change and its impacts; and to required infrastructure and services for easy climate actions not being available.
  - (iii) Strategically, some of the first steps, which are:
    - to help more Timaru District stakeholders understand and appreciate the impact of climate change in the district
    - enable easier climate-friendly actions in change adaptation and emission mitigation
  - (iv) Summarise those issues where stakeholders need immediate support as they try to understand and take actions due to the immediate nature of the challenges e.g.

- coastal inundation and storm-erosion of farmland, wetlands/lagoons and coastal settlements
  - river flooding in extreme weather events
  - crop losses due to a range of climate change factors, especially from extreme weather events (i.e. not just slow increases in average temperature)
- (v) The Principles of the TDCCS
- (vi) Other work streams
- (vii) Key recommendations to all stakeholders
- (viii) Proposed establishment of a South Canterbury Climate Trust or similar entity. Ideally funded by a number of agencies and organisations such as ECan, TDC, Waimate District Council, Mackenzie District Council, central government and the private sector.

### Options and Preferred Option

- 13 The First Timaru District Climate Strategy is a District-wide Strategy from which Timaru District Council may select some relevant actions.
- 14 Option 1 is to note the strategy, refer it to Officers for consideration as they prepare the next Long Term Plan and also encourage interest and use in the wider community.
- 15 Option 2 is to take a more-enabling role informed by the Strategy, showing leadership through taking actions related to Council services and responsibilities and to further develop actions in the wider community behaviour through supporting the establishment of a community trust or similar entity or utilising an existing entity. This is the preferred option.

### Consultation

- 16 The First Timaru District Climate Change Strategy has been produced in consultation with hundreds of members of the community and stakeholders as well as ratified by an Advisory Group of 24 citizens who have helped guide the strategy process, establish principles and discussed the evidence gathered.

### Relevant Legislation and Plans

- 17 Relevant legislation and plans are as follows:
- Energy Efficiency and Conservation Act 2000
  - Climate Change Response Act 2002 and Climate Change Response (Zero Carbon) Amendment Act, 2019 sets a target of zero by 2050 on net greenhouse gas emissions, other than biogenic methane.
  - Decarbonising Transport Action Plan 2022-2025 (Dec 2022)
  - NZ's First Emissions Reduction Plan (May 2022)
  - NZ's First National Adaptation Plan - Adapt and Thrive: Building a climate-resilient New Zealand (Aug 2022)
  - A low emissions future for Aotearoa (May 2021, Climate Commission advice to Government)

- & forthcoming, as part of RMA replacement: a Climate Adaptation Bill.

**Financial and Funding Implications**

- 18 There are no financial implications associated with receiving this strategy as no commitments have been made in implementation to date beyond use of an already set annual budget for climate change response. The budget will need to be re-examined in the next Long Term Plan process.

**Other Considerations**

- 19 There are Government targets set for reducing public sector carbon emissions. There is a requirement for Council operations to begin reporting carbon emissions to Ministry for the Environment in 2024. Separate reporting by the Climate Change Advisor to this Committee is scheduled and it is not therefore a focus of this report.

**Attachments**

1. **Draft Timaru District Climate Change Strategy**

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

# Timaru District Climate Change Strategy

## First Report April 12 2023

*The science of climate change is unequivocal – we are causing it*

*Its impacts are inevitable and accelerating because we are not reducing emissions*

*Taking action is optional*

*Our choice: We pay now or we make our children and grandchildren pay much more*

*“This is urgent!” Anita says. “Everything we value is at stake if we do not reduce our emissions! But regardless of the level of global emissions reductions we achieve, we will experience some changes in climate. We need to start planning now, across all sectors, and all levels, and do things differently, to minimise the disruption this will have. And maybe in the process we can even make New Zealand a better place to live.”*

Professor Anita Wreford, Leader, Deep South Challenge, Lincoln University

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## Contents

The Timaru District Climate Change Strategy (TDCCS) is in 5 parts.

Part 1: Executive Summary and key recommendations

Part 2: The challenges and impacts of climate change in the Timaru District

Part 3: The Principles that apply to all elements of the TDCCS

Part 4: A set of SubStrategies on specific topics

Part 5: Appendices and references

## Acknowledgements

Development of the TDCCS was funded by Timaru District Council (TDC) with the express instruction that the TDCCS reflect our community's views on climate action throughout the Timaru District. The TDCCS has therefore been created by, with and for our Timaru District stakeholders as a community strategy, not a Timaru District Council (TDC) strategy.

This First Report on the Timaru District Climate Change Strategy encapsulates input from Timaru District Communities and has been prepared for all District stakeholders. As such it is not a report solely to or for the Timaru District Council. It is a report for all stakeholders which specifically does not state which stakeholders should take actions on each issue as it is up to each stakeholder to decide what actions they take.

We thank the hundreds of Timaru citizens, businesses, organisations and community groups who have contributed to our public workshops and discussions. We also appreciate the many informative inputs from TDC staff, councillors and mayor and from staff of Environment Canterbury and the Department of Conservation as we address the huge scale and complexity of climate change and its impacts in the Timaru District. We particularly thanks the TDCCS Advisory Group who added rigour and robustness to this report.

It is recommended that the TDCCS continue to evolve, probably led by a new entity such as a South Canterbury Climate Trust (See Appendix 5) containing a mix of topic-experts and community members.

## Disclaimer

As TDCCS facilitator I have taken every care to accurately weave together the many and diverse stakeholder perspectives on climate change in the Timaru District. In doing so I take full responsibility for the content of this *Version #1* TDCCS and welcome assertive feedback from all stakeholders.

Dr Phil Driver

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021 0236 5861

April 12<sup>th</sup> 2023



First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

## Part 1: Executive Summary

### 1.1: Background

The TDCCS faces three major challenges:

1. A lack of willingness by most New Zealanders to take serious action on climate change
2. Uncertainty about how fast climate change and its impacts are accelerating, resulting in a lack of information on locally-specific impacts of climate change in the Timaru District
3. Legislative uncertainty due to the replacement of the Resource Management Act, especially with the new National Adaptation Plan, and the review of the Local Government Act

A large majority of New Zealanders accept that humans are unequivocally causing seriously harmful climate change and want more action taken (refer to the bibliography for supporting information). However, a majority are not yet prepared to seriously reduce their fossil fuel use or their consumption of products with high embedded greenhouse gas emissions.

*This reluctance to act can be addressed by enabling better and easier climate-friendly actions plus either inspiring or compelling those actions.*

This Timaru District Climate Change Strategy (TDCCS) therefore seeks to identify viable ways of *enabling* and *inspiring* or *compelling* easier climate-friendly actions by many stakeholders throughout the Timaru District.

The TDCCS necessarily starts from where our communities are currently at in terms of their awareness of issues and willingness to act. This First Report on the TDCCS April 2023 therefore prioritises information gathering and public dissemination, with a limited number of community-driven *physical* solutions. This is because large sectors of the community are still trying to understand climate change before *they* can *collectively* create and implement solutions.

Following the high-energy and stimulating public workshops, a strategy such as this often appears tedious and dry and implementation can be painstaking. This is inevitable. There are seldom any earth-shattering new ideas in community strategies but rather many smaller ideas that simply need hard work to define, join-up where relevant, secure stakeholder buy-in and implement.

Kia kaha!

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

### 1.2: Climate science

Climate change is happening and humans are unequivocally causing it to happen 200 times faster than any time in the last 180,000 years. Despite 27 COP international conferences on climate change, greenhouse gas emissions continue to rise. Even if all COP country-by-country pledges are met, global heating will exceed 3.2 degrees by 2100. Few pledges have been met so far, so it would take considerable optimism to believe that global heating will not exceed 3.2 degrees by 2100.

Per capita, New Zealanders are the 6<sup>th</sup> highest emitters in the world so if we are not prepared to reduce our emissions then we cannot reasonably expect others to do so.

The Canterbury Climate Change Risk Assessment report predicts that the local impacts of climate change will include coastal inundation and erosion, more extreme weather events, crop losses, loss of biodiversity, heat stress (humans, animals and plants), bigger river and storm-surge floods, less resilient water supplies, rising groundwater infiltrating septic tank systems, broken transport links, major infrastructure damage and more wildfires.

However, the report did not identify which specific assets and operations are at risk, or the cultural, social, environmental and economic impacts of these climate change impacts.

So as to guide our local, climate-friendly actions it is essential and urgent that Timaru stakeholders identify, quantify and disseminate to *all* stakeholders, location-specific information on the impacts of climate change on all 4 well beings.

### 1.3: Local responses

*Most responses to climate change will happen in our communities*, often guided by legislation and market forces, as well as infrastructure responses by local and central government and the impact of global shortages of key resources.

Unequivocally, business-as-usual is not an option

Current legislation does not effectively address climate change. Hopefully within a few years, the replacement of the Resource Management Act including the crucially important Climate Change Adaptation Act plus an updated Local Government Act will contain effective legislation for both climate change mitigation and adaptation. A crucially important question relates to compensation: who (if anyone) gets compensated under what terms and who pays?

In this legislative vacuum and New Zealanders' general hesitancy to mitigate climate change, Timaru District Council chose to support the development of a Timaru District Climate Change Strategy (TDCCS) *for the entire district, not just for the council.*

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

While the primary TDCCS focus is initially on those strategic actions that are likely to gain immediate community buy-in, future consideration must be given to those essential actions that communities are not yet prepared to take but where their willingness to take action could change suddenly due to extreme weather events, legislation or the better enabling of climate-friendly actions. Effective SubStrategies need to be in place for when communities suddenly demand action and are themselves prepared to act. The late January and February 2023 floods in Auckland and Hawkes Bay demonstrate the need for such pre-developed SubStrategies.

#### 1.4: Progress on the TDCCS

Through 30 hours of public workshops involving several hundred people plus many hours of discussions with key stakeholders including TDC and ECan staff, the draft TDCCS has achieved the following:

1. Several hundred Timaru stakeholders are now better informed and more motivated to take climate-friendly actions
2. Identification and very rough scoping of the scale of climate change impacts in the Timaru District, exacerbated by the probability of the alpine fault rupturing (Part 2 Table 2.1). By 2100
  - o Cumulative costs of one-off impacts are likely to be several \$billion
  - o Annual impacts are likely to cost \$100s of millions
  - o Social, environmental and cultural costs will also be high
3. Widespread community and organisational agreement on a set of Principles (see Part 3) that apply to all elements of the TDCCS
4. Community identification of 6 initial priority topics which have potential for *community* actions to determine what people need to *enable easy inspired actions* to address climate change. These initial topics are
  - o Coastal Inundation and Erosion
  - o Domestic Food Resilience
  - o Low Emission Resilient Transport
  - o Domestic Water Resilience
  - o Actions for Individuals and Community Groups
  - o Commercial Food Resilience
5. Distillation of these topics into first drafts of 6 SubStrategies (See Part 4). SubStrategies are based on the PRUB-Logic strategic framework (Appendix 2 in which:

*Projects create Results that enable (and sometimes compel) Uses to create Benefits.*

Typically, organisations, governments, businesses and community groups run the Projects to create the Results (assets) that people/citizens/nature then Use to create Benefits. To achieve significantly improved mitigation of and adaptation to climate change, we need *both* Projects (run by the bigger stakeholders to produce Results) *and* Uses (of the Results by citizens) to produce improved climate-friendly outcomes/Benefits.

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

6. Timaru stakeholders' identification *so far* of another 11 topics, especially topics of a commercial nature e.g. the impacts of climate change on the Washdyke industrial area and the port. These topics have not been assessed plus it is likely that there are more topics that need to be addressed. These topics, which were beyond the current scope of the TDCCS, include:
  1. Inundation and erosion of commercial land around the port including the main trunk railway line near the port
  2. Inundation and erosion of land in industrial areas such as at Washdyke, also impacting on the Washdyke rail and road networks
  3. Other impacts on the main trunk line away from the port and Washdyke due to coastal inundation and erosion and river flooding and the impacts if the line needs to be moved (land acquisition, loss of the current stop-bank protection provided by the existing line, questions on the relative merits of retaining the rail link or decarbonising road transport etc)
  4. Threats to TDC infrastructure, especially roads, bridges and existing and closed landfills – being addressed in-house by TDC staff
  5. The costs of buying carbon credits from uncertain or not-yet-established international carbon trading platforms or creating afforestation to offset council's emissions – being addressed in-house by TDC staff for TDC emissions but not for other stakeholders' emissions
  6. Sustainable is Attainable – a climate-friendly initiative by a cluster of companies in Washdyke
  7. In-house climate-friendly actions by individual companies such as Temuka Transport, Hilton Haulage, Fulton Hogan, McCains and others
  8. Construction-sector climate change impacts
  9. Threats to the District's electrical power distribution system (being addressed by Alpine Energy through a 16 week strategy exercise started March 2023)
  10. Impacts of climate refugees, potentially 10-30,000 arrivals within 50-100 years
  11. Nature's water resilience such as catchment management
  12. And likely other sector-based issues
- Preparation of this DRAFT TDCCS which pulls together a huge amount of information gathered from our communities and many other sources and distils and recommends a *first round* of doable climate-friendly actions

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

#### 1.4: Overarching recommendations

1. That TDC *and other stakeholders* establish and resource a new entity such as a South Canterbury Climate Trust covering also Waimate and McKenzie Districts (see Appendix 5) to take all or some of the following actions:
  - Implement or guide implementation of the high priority recommendations as indicated by \*\*\* in the following pages
  - Continue to develop the initial 6 SubStrategies
  - Develop draft SubStrategies on the 11 topics that have not yet been addressed
  - Implement a range of projects that *enable, make easy and inspire or compel* climate friendly actions by individuals and communities
2. That the next version of the Timaru District Plan include a statement along the lines of: “This District Plan explicitly recognises the substantial uncertainty and potentially major impacts of climate change in our District. Where communities are seriously impacted by climate change, relevant elements of this District Plan can be modified by a majority vote (or 75%?) in council to accommodate robust responses to these impacts.”

The following further high priority recommendations are in 2 sections:

Section 1: Recommended Principles and related actions

Section 2: Recommended topic-specific actions

**\*\*\* Urgent/major recommendations are marked with \*\*\***

Other less urgent recommendations are included elsewhere in this report.

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

### **Recommendations on Principles**

See Part 3 for details relating to these recommended Principles. These recommendations are proposed for *all* stakeholders in the Timaru District, not just for local or central government entities.

#### **\*\*\* Recommendation #2. Scope of Climate Change Impacts**

*That central and local government agencies operating in the Timaru District work with Timaru District's communities plus subject-matter experts to*

*2.1: by September 2023, create a comprehensive set of information on all the different types, magnitudes, locations and timings of local climate change impacts in the Timaru District. This would in essence be a more comprehensive and location-specific version of The Canterbury Climate Change Risk Assessment report prepared by Tonkin and Taylor for the Canterbury Mayoral Forum in February 2022.*

*2.2: by December 2023, create a comprehensive list of local options for responding to the impacts of climate change as identified in 2.1 above, together with a list of criteria for prioritising the options*

*2.3: By July 2024, prioritise the local options for climate action in the Timaru District*

### **Recommendations on topic-specific actions – see Part 4 for details**

As noted earlier, several hundred concerned Timaru District stakeholders have been going up a steep learning curve about climate change through engaging in TDCCS public workshops. At the same time, the majority of people in New Zealand and the Timaru District have a very limited understanding of the anticipated economic, social, environmental and cultural impacts of climate change in their localities. This lack of understanding is because either the information is not available at all or people have not received it in a form that makes sense to them.

The recommendations on each climate change topic are therefore primarily about *assembling and disseminating the necessary information and helping affected stakeholders understand:*

- the science of climate change and how it is evolving
- the likely physical impacts of climate change at the local level
- how communities can achieve the best outcomes by working together and
- subsequently to triage and develop optimal solutions.

First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

### Topic #1: Coastal Inundation and Erosion (CIE) Recommendations

#### CIE Recommendation 1.1

\*\*\* CIE Advocate: Appoint an independent advocate to help stakeholders who are or will be badly affected by CIE to define their preferred options and to advocate to TDC, ECan and other legislative bodies to find ways to permit these options, even if that means reasonably 'bending the rules'. Details of this role are still to be clarified depending on each group's needs, with the role intended to 'advocate for communities' rather than being a legal advocate.

#### CIE Recommendation 1.2

\*\*\* Local working parties to answer locally-specific questions: Empower affected stakeholders to work as communities to find answers to *their* questions and triage potential solutions by establishing (where they do not already exist) and supporting working parties representing each affected area, e.g. Milford Huts, Rangitata Huts, Pareora and St Andrews, farming communities etc. Likely support to include an independent facilitator but the details of this role are still to be clarified depending on each group's needs.

#### CIE Recommendation 1.3

\*\*\* Potential solutions: Help all stakeholders become fully informed of options by preparing and disseminating to affected stakeholders the full range of *potential* short (less than 5 years), medium (5-50 years) and longer term options for addressing the impacts of coastal inundation and erosion in relation to their specific needs (i.e. one report for each working party as per '1' above).

### Topic #2: Domestic Food Resilience (DFR) Recommendations

#### DFR Recommendation 2.1

\*\*\* Emergency food supplies: Identify and characterise all local commercial and domestic food sources that could be quickly made available following a disaster-level event such as massive storms or the fracturing of the Alpine Fault (AF8 scenario) and establish mechanisms for rapidly distributing the food.

#### DFR Recommendation 2.2

\*\*\* Food vulnerability: Identify, assess and document all forms of food vulnerabilities in the Timaru District and recommend options for helping those who are most vulnerable.

#### DFR Recommendation 2.3

\*\*\* Foraging: Identify and document the scope for enabling free food foraging through establishing and maintaining food producing trees, bushes and crops on public land

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### **Topic #3: Low Emission Resilient Transport (LERT) Recommendations**

#### LERT Recommendation 3.1

\*\*\*Determine people's willingness to act on LERT: Understand what people will *actually* do, both now and in the future and at what scale, if the right infrastructure and environment were put in place e.g.

redesigned/rebuilt 'pro-social transport corridors/roads/paths' with vehicle restrictions that make active transport safer

better/different public transport

easier and more informed local (commercial and domestic) production of food and other currently-imported products

#### LERT Recommendation 3.2

\*\*\* Campaign to promote climate friendly transport options that do not need new infrastructure: Campaign to encourage people to halve their trips for buying consumables

### **Topic #4: Domestic Water Resilience (DWR) Recommendations**

#### DWR Recommendation 4.1

\*\*\* TDC municipal and community water supplies: TDC to continue its programme of upgrading water treatment facilities and installing water meters to help maintain water quality and reduce consumption

#### DWR Recommendation 4.2

\*\*\* Property-based water management: Timaru District stakeholders increasingly manage water on their properties through a mix of reduced in-house consumption, rainwater tanks, lower-irrigation-demand plants and increased on-site absorption of rainwater



First Report on the Timaru District Climate Change Strategy April 12 2023 P M Driver and Associates

#### **Topic #5: Personal Climate Actions (PCA)**

##### PA Recommendation 5.1

\*\*\*Project to identify Personal Climate Actions that are already enabled/compelled/inspired: Given that Personal Climate Actions need to be enabled plus either compelled by legislation or inspired by Benefits, this Project will identify those Personal Climate Actions that *are already* enabled and which are *already* compelled or which *already* appear highly likely to generate Benefits for stakeholders as well as Personal Climate Actions that could easily become able to meet these criteria. This Project will therefore determine which of the Personal Climate Actions in the following SubStrategy are likely, or unlikely, to happen, and why.

##### PA Recommendation 5.2

\*\*\* Campaign to promote Personal Climate Actions: Leading stakeholders develop and run a campaign to encourage stakeholders to take Personal Climate Actions that are climate-friendly, with a theme of *'Double the Good, Halve the Bad'*.

#### **Topic #6: Commercial Food Resilience (CFR) Recommendations**

CFR recommendations will be identified during and after a CFR public workshop on the 5<sup>th</sup> July 2023

#### **Topics #7-17: Other SubStrategy Recommendations**

Recommendations from other SubStrategies will be distilled from these SubStrategies once they have been created.

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Part 2: Challenges and Impacts of Climate Change in the Timaru District  
The Executive Summary set the context and intentions of the TDCCS.

Table 2.1 attempts to put financial numbers on the impacts of climate change in the Timaru District.

The numbers in the table are *informed best-guesses of the magnitude of the impacts so must not be relied on*. However, they are useful for indicating the relative scales of the various impacts as a starting point for then more accurately quantifying those impacts that appear to be most significant.

In addition to the financial impacts, climate change will also have major social, cultural and environmental impacts which need to be identified and quantified along with the financial impacts.

Stakeholders need to review the numbers in table 2.1 to determine:

1. if they are roughly accurate (and improve them if not)
2. if they are big enough to take action on
3. who can potentially take action on the significant issues
4. what can potentially be done about the significant issues

Consciously deciding to take no action on any of these issues  
is as significant a decision as deciding to take action.

**See: \*\*\*Recommendation #2. Scope of climate change impacts**

*That central and local government agencies operating in the Timaru District work with Timaru District's communities plus subject-matter experts to*

*2.1: by September 2023, create a comprehensive set of information on all the different types, magnitudes, locations and timings of local climate change impacts in the Timaru District. This would in essence be a more comprehensive and location-specific version of The Canterbury Climate Change Risk Assessment report prepared by Tonkin and Taylor for the Canterbury Mayoral Forum in February 2022. (this task would provide robust information to update table 2.1 below)*

*2.2: by December 2023, create a comprehensive list of local options for responding to the impacts of climate change as identified in 2.1 above, together with a list of criteria for prioritising the options*

*2.3: By July 2024, prioritise the options for climate action in the Timaru District*

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**Table 2.1. Key effects and impacts of Climate Change in the Timaru district within 50-100 years. The information and numbers in this table are incomplete and somewhat speculative but likely to be of the right order of magnitude. This analysis focuses primarily on economic impacts. However, climate change is already impacting on environmental, social and cultural factors ('esc-factors') and these need to be added to this table. Because many numbers are so large it is essential that Timaru District stakeholders undertake a more thorough analysis of all issues in this table.**

Physical Climate Changes	Affected assets, resources, operations, people and animals	Types of effects	Estimated annual cost if no new action taken	Estimated one-off cost to minimise annual costs
Increased air temperatures over land	Heat stress for all species, stronger winds, more intense but less frequent rainfall, melting glaciers and ice caps leading to sea level rise	Human and animal health, crop losses (drought, hail, late and early frosts, floods, extremes of humidity), wildfires, windthrow especially trees damaging assets like power lines, spread of warmer-climate pests and diseases, more intense droughts, more severe floods damaging infrastructure (roads, bridges, communications, power, buildings, refuse dumps, fences), shrinking lagoons and loss of Mahinga Kai opportunities	Crop losses \$10s-100s of millions (A 10% loss on \$1.6 billion of agricultural production = \$160 million), health losses \$millions-10s of millions, fires \$millions-10s of millions, asset damage \$10s-100s of millions, loss of production forests to fire/windfall \$10s of millions, all plus esc-factors	Transition to alternative heat-resistant crops \$10s of millions, cooling of buildings \$10s of millions; replace fire-risk forests with natives \$10s-100s of millions, restructuring rivers \$10s-100s of millions, relocation of assets \$100s of millions to \$billions, all plus esc-factors
Increased sea water temperatures	Fish, seaweeds, further sea level rise	Changes in harvestable marine species, loss of some species, more evaporation making storms more intense including more rainfall and higher storm surges, coastal inundation and erosion, loss of port land and Washdyke industrial land, need to relocate the main trunk line, shrinking lagoons and loss of Mahinga Kai gathering and foraging opportunities	Fishing \$millions? Intense rainfall leading to river flooding \$10s-100s of millions, coastal inundation and erosion flooding homes, farms and infrastructure \$100s of millions, all plus esc-factors	Stop banks \$10s of millions, relocations of assets \$100s of millions, all plus esc-factors

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Increased freshwater temperatures	Rivers, lakes, wetlands, open water storage ponds, species that live in the freshwater	Toxic algal blooms killing species and making freshwater unusable for drinking and recreation, loss of freshwater species (may already threatened with extinction), loss of Mahinga Kai gathering and foraging opportunities	Environmental, social and cultural losses, additional water treatment cost of \$millions-\$10s of millions, all plus esc-factors	~ \$10s-100s of millions to restore freshwater environments to better cope with climate change, all plus esc-factors
Temperature rises making overseas areas uninhabitable	Impossible living conditions for humans and many species	Climate refugees coming to NZ, perhaps 10-20,000 coming to the Timaru District by 2100	Resettlement/housing at \$100k/person at 1000 people/year = \$100million/year – probably becoming significant within 10-20 years, all plus esc-factors	Probably inevitable unless prevented by central government immigration legislation, all plus esc-factors
Overseas markets demanding that NZ's products are produced in climate-friendly ways	Food production businesses (farmers, transporters, processors, exporters)	Changes in farming practices, especially severely reducing or modifying high emission farming (primarily dairy and red meat production)	\$10s-100s of millions plus esc-factors	\$10s or 100s of millions to modify NZ's farming practices to reduce emissions sufficiently to satisfy overseas markets (it is not enough to satisfy ourselves – the market will dictate what is acceptable), all plus esc-factors
Increased competition from low-emission foods (bioreactor-grown dairy and meat)	Food production businesses (farmers, transporters, processors, exporters)	As plant-based and non-animal foods (including bioreactor-grown 'meat' starting with animal cells) proliferate and reduce in price NZ will find it harder and hard to sell its high-emission produce (in Singapore alone there are over 30 companies working on bio-reactor-grown meats)	\$100s of millions/year or higher plus esc-factors	\$100s of millions to transition to more climate-friendly food production plus esc-factors

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Collapse of off-shore carbon trading markets	Anyone buying carbon credits in international markets. Such markets currently either do not exist or have rapidly falling credibility	Loss of ability to off-set emissions by farmers, businesses and local and central government	\$100s of millions plus esc-factors	\$100s of millions plus esc-factors
Compounding factors – Alpine Fault	The rupture of the Alpine Fault, predicted to rupture with a 75% probability within 50 years	Hydro power generation and transmission likely to be severely damaged so could be out of operation for months or years, major damage to other infrastructure and buildings including homes and hospitals	\$100s of millions to \$billions plus esc-factors	\$100s of millions to \$billions plus esc-factors
Compounding factors - Loss of coastal gravel due to the Waitaki dams preventing gravels reaching the coast and the port breakwater preventing heavier gravels migrating north	All assets which are subject to coastal erosion including industrial sites, land around the port, farmland, coastal settlements and lagoons	Loss of: industrial sites, storage around the port, productive farmland, Mahinga Kai opportunities, coastal settlements and disappearing lagoons (which mean there is less buffer storage during floods so lagoon levels rise more rapidly and flood surrounding land)	\$10s-100s of millions plus esc-factors	\$10s-100s of millions plus esc-factors
Other major impacts of climate change in the Timaru District so these need to be identified and quantified as soon as possible				

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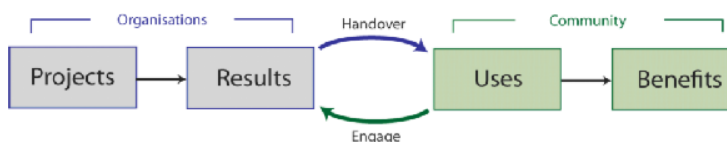
Given the nature, scale and breadth of issues identified in Table 2.1, it is clear that most climate change impacts and actions will happen in communities, businesses and farms. Certainly governments at all levels will need to enable the best and easiest climate-friendly actions and either compel or inspire them.

To provide a robust information structure for working with the large amount of information that has been collected on climate change and its impacts, the TDCCS has chosen to use the succinct PRUB-Logic format (Appendix 2) in which:

*Projects produce Results that enable easy Uses to create Benefits*

In more detail:

*Projects (generally led by governments, businesses and community groups)  
 produce Results (assets/outputs) that enable (and sometimes compel)  
 easy Uses (ongoing actions by citizens) to  
 create Benefits (outcomes) that in turn inspire the Uses*



This strategic logic is used in the TDCCS to create ‘SubStrategies’ (Part 4 of this report) on specific topics such as Coastal Inundation and Erosion, and Domestic Food Resilience. At this stage the SubStrategies have identified many potential Projects, Results, Uses and Benefits but due to the major uncertainties identified at the start of this document, has not attempted to link them rigorously in a PRUB-Logic sequence.

In addition to creating the topic-specific SubStrategies, the TDCCS has identified a set of Principles (Part 3 of this report) to guide all actions in the TDCCS.

Each SubStrategy is in the same format, consisting of “the smallest amount of strategic information that has the highest value to the most people”. This is presented as tables of detailed information on all potential Projects, Results, Uses and Benefits.

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### Part 3: Principles of the TDCCS

#### Introduction

The Timaru District Climate Change Strategy (TDCCS) is an evolving district-wide, multi-stakeholder climate change strategy for all stakeholders in the District, not just for Timaru District Council or other government agencies. The TDCCS has the following structure:

1. A set of guiding Principles (this Part 3)
2. A suite of SubStrategies, each on a specific climate change topic (Part 4)

The following set of Principles was discussed in December 2022 with the TDCCS Advisory Group and based on their feedback was updated and presented to the Advisory Group in late March 2023 for their further feedback. This set of Principles and the initial SubStrategies are scheduled for presentation to the Environmental Services Committee of Timaru District Council (TDC) in May 2023.

Each SubStrategy has been developed in conjunction with affected Timaru District stakeholders and relevant agencies and, subject to ongoing support, *will continue to evolve in a similar manner.*

The TDCCS is being developed by and with Timaru District stakeholders and is in the public domain. It will be up all stakeholders including TDC and other local and central government agencies to decide if/how to engage with the TDCCS, ideally by collectively helping to facilitate its evolving development and ongoing implementation.

#### The Principles

The following set of Principles are presented for review, refinement and adoption by the TDCCS. As outlined in Appendix 1, these Principles have been distilled and woven together from the extensive list of sources in the bibliography of this report.

Ten primary Principles have been identified and explained below. A further 9 Principles are taken as 'givens' without need for explanation.

One or more recommendations have been attached to each Principle. Some recommend that the principle be accepted by all stakeholders in the TDCCS. Others, for example Principle #1 Equity/Justice/Fairness, recommend that action be taken at government level to clarify the exact in-practice impacts of this Principle.

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Principle #1: Equity/Justice/Fairness

The Principle of equity/justice/fairness is universal in all stakeholder inputs to this TDCCS.  
This principle applies:

- Demographically – to all people
- Intergenerationally – to all generations (Stewardship/Kaitiakitanga/Being good ancestors)
- All species – to all living beings
- The environment – to the water, air and earth

This principle is easy to say at the highest level but is very challenging to implement practically:

- Who pays if no action is taken?
- Who pays to take action?
- Is compensation paid and if so how much and under what conditions?
- Does action to protect human interests have priority over nature's interests?
- How many generations are taken into account to achieve intergenerational equity?
- Who benefits from actions or inactions?
- How are national and global issues weighed up against local issues?
- How are benefits shared?

Many potential climate-friendly actions will not happen until the above questions have been rigorously answered and embedded in how we respond to climate change. It can be argued that defining how to implement this Principle of equity/justice/fairness is the biggest initial strategic challenge facing our communities, our governments, New Zealand and the world. The New Zealand government is currently attempting to address this issue through its National Adaptation Plan (which is still Work-in-Progress)

*Recommendation #1: That by July 2023, New Zealand's central and local governments develop and implement policies, processes and funding mechanisms that will underpin the implementation of this Principle of equity/justice/fairness.*



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Principle #2: Understanding/knowledge/MĀTAURANGA/Education/skills

All stakeholder inputs to the TDCCS emphasised the need for local actions that address climate change to be robustly based on the widespread understanding of constantly evolving bodies of information, evidence and knowledge. This information and evidence must weave together historical and recently gained knowledge and address all four wellbeings: economic, social, cultural and environmental.

*As at 2022 there appears to be sufficient general scientific knowledge of climate change to enable us to understand its causes and most of the general impacts of climate change. Gaining more such general information is unlikely to advance our actions on climate change.*

Indeed, a large part of the challenge of addressing climate change is distilling what really matters locally from the plethora of reports, web pages, conversations, policies, plans, strategies, principles and opinions that already exist.

*In contrast to the wealth of general climate change information, locally-specific scientific and practical knowledge of the impacts of, and solutions for, climate change, are less well collated, disseminated and understood.*

**\*\*\*Recommendation #2: That central and local government agencies operating in the Timaru District work with Timaru District's communities plus subject-matter experts to**

**2.1: by September 2023, create a comprehensive set of information on all the different types, magnitudes, locations and timings of local climate change impacts in the Timaru District. This would in essence be a more comprehensive and location-specific version of The Canterbury Climate Change Risk Assessment report prepared by Tonkin and Taylor for the Canterbury Mayoral Forum in February 2022.**

**2.2: by December 2023, create a comprehensive list of local options for responding to the impacts of climate change as identified in 2.1 above, together with a list of criteria for prioritising the options**

**2.3: By July 2024, prioritise the options for climate action in the Timaru District**

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Principle #3: Future proofing/resilience/urgency/long term thinking

Contributions to the TDCCS consistently emphasised that a long term perspective must be a core element of Timaru District's responses to climate change coupled with urgent action where necessary. Solutions to climate change must embed long term resilience as part of a staged Dynamic Adaptive Planning process (See Appendix 4) which recognises that while interim solutions can be optimal for periods of time, ultimately long term solutions must be adopted to achieve resilience in the face of ongoing climate change.

This Principle #3 overlaps Principle #1: Equity/Justice/Fairness in that solutions to address climate change will impact current and future generations, with future generations reliably predicted to face much worse impacts *and costs* than current generations.

*Recommendation #3: That all stakeholders addressing climate change in the Timaru District understand the principles of Dynamic Adaptive Planning and include long term resilient solutions alongside shorter-term urgent solutions in all their climate change strategies.*

Principle #4: Support/sharing/collaboration/weaving

Timaru District stakeholders together with all other climate-change-related documents considered as part of the TDCCS emphasised the importance of this Principle of support/sharing/collaboration/weaving. This Principle overlaps Principle #1: Equity/Justice/Fairness by recognising that many people and environments will need help in order to thrive under the impacts of climate change. International experience (reference) demonstrates that *when communities act collectively in response to climate change, the outcomes are better than when individuals go-it-alone.*

We all have different starting points and resources when it comes to addressing climate change and we will all be affected differently. Knowledge about climate change and how to respond is widely distributed throughout our communities and we can continually weave our ideas together. As we all try different solutions to this new and uncertain environment of climate change we can learn from each other what does and does not work in our rapidly evolving world. Some of us will struggle merely to survive whereas others will have surplus time, money and other resources that they can contribute to supporting those who are more vulnerable, in many different ways, to the impacts of climate change.

*Recommendation #4: That all Timaru District stakeholders personally commit to sharing their (surplus?) resources to assist those in our communities who are most vulnerable to the impacts of climate change.*

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Principle #5: Whanau/family, Whanui/community

Principle #5: Whanau/family, Whanui/community recognises that the majority of actions responding to climate change will happen in our communities, businesses, families and by individuals. Certainly central and local government agencies have crucial roles to play but major actions such as using much less fossil fuel or changing to climate-friendly diets will happen in our personal lives and communities. In this respect, major stakeholders such as fossil fuel companies have roles to play in supporting transitions to less fossil-fuel-intense forms of energy (noting that at the moment they have minimal incentive to do so).

*Recommendation #5: That all stakeholders in the Timaru District make their climate-response actions consistent with the fact that the majority of actions in response to climate change will occur in our communities and homes and enable and inspire or compel these actions on a large scale*

Principle #6: Precaution

Climate change and its impacts are increasingly well understood while at the same time, many modelled predictions are just that – predictions based on the best available science. Most predictions describe a range of possibilities and to date, *most actual changes have been more severe than average predictions*. Also, COP27 in Egypt confirmed that the world is not yet ready or even capable of voluntarily weaning itself off the extensive use of fossil fuels and high-emission agricultural products. Climate change and its impacts will therefore almost certainly happen at the more adverse end of existing predictions.

The Precautionary Principle (Appendix 4) has long been adopted by international agencies when addressing the closely related topic of sustainability (reference). It is therefore a well-established principle when addressing the uncertainties of working with an evolving global environment.

*The precautionary principle asserts that the burden of proof for potentially harmful actions by industry or government rests on the assurance of safety and that when there are threats of serious damage, scientific uncertainty must be resolved in favour of prevention. (add reference)*

While the Principle of Precaution was not widely discussed by stakeholders in the development of this high level TDCCS, it makes scientific and logical sense to include this Principle in the TDCCS, consistent with its application in global responses to sustainability

*Recommendation #6: That all stakeholders in the Timaru District who are addressing climate change apply this Principle #6: Precaution (The Precautionary Principle) to all decisions on climate change*

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Principle #7: Transparency

Climate change impacts many people in different ways. Similarly, actions in response to climate change will impact many people in many ways, sometimes positively and sometimes negatively. For example, allowing a lagoon to expand over farmland will be beneficial for the lagoon and the collection of Mahinga Kai but costly for a farmer. Similarly, building a river-side stop-bank to protect properties on one bank of a river is likely to adversely impact properties on the other bank of a river.

Therefore all climate change planning and decisions need to be done transparently so that all stakeholders are fully aware of all issues.

*Recommendation #7: That Timaru District stakeholders commit to all climate change planning and decision making being done transparently so that all stakeholders are fully aware of all issues. The only exceptions to this Principle #7 is when one or more stakeholders make a compelling case to the climate-change-affected stakeholders for keeping information confidential*

Principle #8: Work with the power of nature

Timaru District stakeholders acknowledge the power of nature to cause harm, to regenerate and to support our lives. The scale of nature-based actions (storms, floods, sea level rise, extreme weather events, land and wetland regeneration, plagues, diseases) are generally orders of magnitude larger than any human actions we can take. To achieve rapid responses to climate change it makes sense, and is widely supported by Timaru District stakeholders, to explore ways in which nature can help restore a safe and healthy Timaru District.

*Recommendation #8: That when Timaru District stakeholders are making decision on how to respond to climate change, we will explore options in which the power of nature can help us respond positively to climate change and its impacts.*

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Principle #9: Realistic Action

Timaru communities are at various stages of readiness to take different forms of action on climate change. Those who are already directly and significantly impacted by climate change are ready to consider options immediately. Those who may be affected decades into the future are understandably not as urgently motivated. When it comes to mitigation actions for the benefit of the planet but with minimal immediate impacts on local stakeholder's lives or even the lives of their children, motivation to act is often limited.

However, despite stakeholder reluctance to act on some key issues (reduction in fossil fuel use; reduction in the consumption of products/food with high carbon footprints), their motivation to act on these issues could change suddenly due to legislation, extreme weather events, new options being enabled and easy, and new forms of inspirations. Therefore it is recommended that in the medium term, SubStrategies are developed on those significant actions which stakeholders are not yet prepared to take so that the SubStrategies are in place for when stakeholder motivations (suddenly) change.

So this principle of Realistic Action will guide the TDCCS to initially focus on actions which address those issues which:

1. Are unavoidable, e.g. coastal inundation and river flooding that is already increasing or topics where legislation requires action
2. Have sufficient district-wide support that stakeholders are very likely to take worthwhile district-wide action
3. Have sufficient support on a smaller scale such that action will be taken by sub-groups of stakeholders on a smaller but still worthwhile scale

*Recommendation #9:*

*9.1: That when Timaru District stakeholders make decision on how to respond to climate change, we will focus on those actions that can realistically be achieved with the resources, stakeholder and legislative support available to us.*

*9.2: That in the near future, consideration will also be given to developing SubStrategies on logically essential SubStrategies that stakeholders are not yet prepared to implement but where their willingness to act could change suddenly in response to extreme weather events, legislation, new options being enabled and easy, and new forms of inspirations.*

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Principle #10: Determine actions first, then who does them

Most stakeholders in the Timaru District have limited resources and/or limited legislative authority to act effectively on climate change. Public sector stakeholders’ roles and responsibilities are undergoing legislative change through the replacement of the Resource Management Act and the review of the Local Government Act. All stakeholders are continuing to learn more about climate change and its impacts on each stakeholder and across the Timaru district. As such it is currently unclear who has responsibility and authority to act on many climate-change-related issues.

It is therefore essential to first determine what climate-change-responsive actions need to be taken in the Timaru District so that when legislation becomes clearer and we all better understand the issues, we can *at that point* individually and collectively determine who are the most appropriate stakeholders to take the various necessary actions.

*Recommendation #10: That the TDCCS first identify the strategic actions that need to be taken on climate change and then, and only then, identify which stakeholders can/should gain authority and accept responsibility to take those actions.*

*Other Principles*

The following Principles were supported by Timaru District stakeholders and are consistent with principles from related documents. These Principles are taken as ‘givens’ for all those engaged in climate change deliberations, decisions and actions in the Timaru District, without the need for any further explanations.

- |                         |                   |
|-------------------------|-------------------|
| <i>Honour Te Tiriti</i> | <i>Honesty</i>    |
| <i>Integrity</i>        | <i>Kindness</i>   |
| <i>Creativity</i>       | <i>Boldness</i>   |
| <i>Trust</i>            | <i>Positivity</i> |
| <i>Clarity</i>          |                   |

Government entities throughout New Zealand already accept the principle of honouring Te Tiriti and in many instances already have negotiated appropriate agreements with Mana Whenua. This above recommendation therefore *encourages all other stakeholders to also honour Te Tiriti* in ways which continue to evolve throughout the Timaru District.

*Recommendation #11: That the TDCCS’s stakeholders also adopt the following Principles*

<i>Honour Te Tiriti</i>	<i>Honesty</i>
<i>Integrity</i>	<i>Kindness</i>
<i>Creativity</i>	<i>Boldness</i>
<i>Trust</i>	<i>Positivity</i>
<i>Clarity</i>	

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#### Part 4: Topic-Specific SubStrategies of the TDCCS

The TDCCS has so far identified 17 topics where SubStrategies are needed. Just 6 of these have been addressed so far and draft SubStrategies created. The remaining 11 topics, plus others that have yet to be identified, also need to be developed into SubStrategies.

Because of the large number of issues that have been raised by Timaru District stakeholders, the first 6 draft SubStrategies currently consist mostly of a first cut at making sense and providing a strategic framework for this information. Where possible, key initial actions have been distilled as recommendations for each topic.

Many potential actions have been identified but cannot yet to be prioritised by and with stakeholders until stakeholders have a more robust understanding of the nature and magnitude of specific, topic-by-topic climate impacts in the district so that *they* can decide on priorities.

Due to the lack of information relating to evolving, locally-specific climate change impacts, people's reluctance to take climate-friendly actions and the current legislative uncertainties, the SubStrategies do not yet explicitly link Projects through Results and Uses to Benefits. These linkages will become clear and robust once the uncertainties have been resolved.

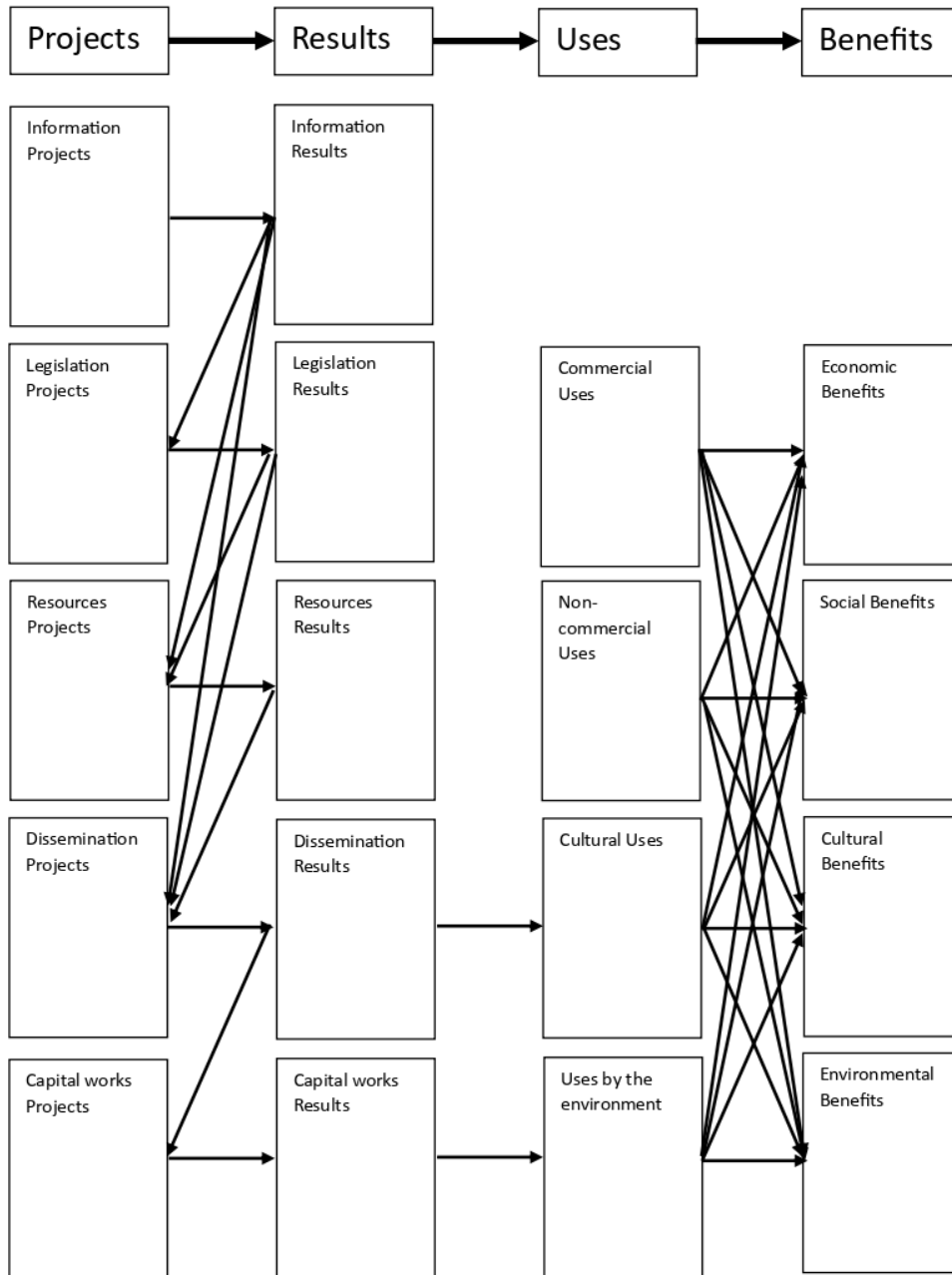
The following draft SubStrategies therefore need to be viewed as informed starting points which need refining and will continue to evolve.

Most SubStrategies impact on other SubStrategies so ideally need to be considered as a single integrated, holistic package, not in isolation. Similarly, fragmenting Uses and Benefits into economic, environmental, social and cultural Uses and Benefits is an artificial construct because most Uses and Benefits are also interconnected. In this context, Timaru District stakeholders consider 'cultural Benefits' to include all cultures.

However, attempting to understand and integrate all issues holistically is humanly impossible. Therefore the TDCCS has disaggregated issues into SubStrategies and where relevant has further disaggregated issues into economic, environmental, cultural and social factors so that they can be reasonably analysed. However such analyses need to continually re-integrate issues to identify and manage interconnected factors.

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All the SubStrategies on the following pages use the PRUB-Logic strategic information framework as shown below. Detailed draft content relating to each Project, Result, Use and Benefit is in the tables on the following pages.





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### SubStrategy #1: Coastal Inundation and Erosion (CIE) of non-commercial land

#### Background

This Coastal Inundation and Erosion SubStrategy is one of a suite of topic-specific SubStrategies that are guided by the Principles of Timaru District Climate Change Strategy. The topic-specific SubStrategies were developed with and by and for everyone in the Timaru District.

The following scenarios are based on information received so far from scientists, local authorities, residents, farmers, Mana Whenua and other stakeholders. These scenarios are unlikely to be totally accurate but may be good indications of what is probable. They are provided here as a baseline for further discussions, not as finalised scenarios.

Likely Timaru District Coastal Inundation and Erosion scenarios in the next few decades if no action is taken

1. Sea level rise + storm surges + larger waves collectively amounting to 1 to 1.5 metres of water above current high tide levels will inundate 1000s of Hectares of land
2. 100-500 metres of loss of coastline as unstoppable coastal erosion continues at around 2m/year coupled with inundation of the lower lying land
3. Loss of all coastal lagoons if they are prevented by stop banks from migrating inland
4. Sea water inundation of several coastal and near-coastal settlements
5. Increased river flooding of near-coastal riverside and low-lying properties due to more extreme storms
6. Loss or relocation of the main trunk railway line and many roads and other infrastructure

Possible Timaru District Coastal Inundation and Erosion scenarios in the next few decades if we take action (to be developed/modified by and with our affected communities)

1. Stakeholders in 2123 look back 100 years and appreciate their good ancestors' decisions
2. Low-lying coastal settlements and homes re-located onto higher ground, possibly retained as existing communities or fragmented relocations of individual homes
3. Abandoned or relocated main trunk line which is currently acting as a 'stop bank' in some places
4. Restored and expanded coastal lagoons offering mahinga kai gathering opportunities and potentially commercial seafood production, inevitably coupled with smaller traditional farms (dairy, sheep and beef, arable, horticulture) that have been inundated
5. Between 2023 and 2053, interim solutions in place which help give affected stakeholders time to develop and implement long term solutions. For example, a medium term solution could be a group farmers abandoning several hundred metres of land to become a wetland in return for a stop bank at the edge of the evolving wetland such that farmers would have the certainty that their remaining land will be farmable for 50 years.
6. Infrastructure abandoned or relocated further inland

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#### CIE Recommendations

The main recommended actions distilled from the Coastal Inundation and Erosion tables as at April 2023 are:

1. **\*\*\* CIE Advocate:** Appoint an independent advocate to help stakeholders who are or will be badly affected by CIE to define their preferred options and to advocate to TDC, ECan and other legislative bodies to find ways to permit these options, even if that means reasonably 'bending the rules' with the express approval of elected members. Details of the advocate's role is yet to be clarified depending on each group's needs but is likely to be someone who 'advocates-for' communities rather than a 'legal advocate'.
2. **\*\*\* Local working parties to answer locally-specific questions:** Empower affected stakeholders to find answers to *their* questions and triage potential solutions by establishing (where they do not already exist) and supporting working parties representing each affected area, e.g. Milford Huts, Rangitata Huts, Pareora and St Andrews, farming communities etc. Each working party needs a skilled, locally knowledgeable (almost certainly paid or compensated) facilitator who is not captured by vested interests. There also needs to be a separate overseeing coordinator of all the facilitators who addresses issues that are common to all working parties and who is familiar with processes for securing resources and engaging with governing authorities and agencies. Details of the facilitators' roles to be clarified depending on each group's needs
3. **\*\*\* Potential Solutions:** Help all stakeholders become fully informed of options by preparing and disseminating to affected stakeholders the full range of *potential* short (less than 5 years), medium (5-50 years) and longer term options for addressing the impacts of coastal inundation and erosion in relation to their specific needs (i.e. one report for each working party as per '1' above).

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Details of the evolving CIE Projects, Results, Uses and Benefits

Information Projects-Results

Information Projects	Information Results
<p><u>Overarching role of the information Projects:</u> The overarching information project is to identify, evaluate and include/exclude information for each of the information-boxes on Projects, Results, Uses and Benefits throughout this SubStrategy. The boxes in this evolving SubStrategy currently contain information that has already been explicitly identified as relevant to this SubStrategy as well as numerous other concepts that have yet to be fully understood, evaluated and included/excluded in the SubStrategy</p>	<p>Over time, a fully populated Coastal Inundation and Erosion SubStrategy for the Timaru District</p>
<p><u>Collation of independent reports:</u> Consolidate existing independent reports on climate change, CIE and other contributing factors</p>	<p>A 'CIE Independent Reports Library' – estimated as 50% complete as at February 2023 and held by Timaru District Council</p>
<p><u>Human stakeholders' Uses and Benefits:</u> Understand and document <i>the full spectrum</i> of desired human stakeholders' Uses and Benefits for 2050, 2100 and 2150.</p>	<p>A 'CIE Uses and Benefits Report' which defines human stakeholders' full spectrum of desired Uses and Benefits in response to coastal inundation and erosion as at 2050, 2100 and 2150. This will include narratives, ancestry, emotions, community spirit and other non-physical stories</p>
<p><u>Ecosystem Uses and Benefits:</u> Understand and document <i>the full spectrum</i> of desired ecosystem Uses and Benefits for 2050, 2100 and 2150.</p>	<p>Documents which represent natural ecosystems 'Uses and Benefits' including what is best for the ecosystems and also how ecosystem services can enhance human lives</p>
<p><u>Community-based communication channels:</u> Establish and run 'messaging trees'/chains which send information freely to all stakeholders</p>	<p>Affected stakeholders are informed as early as possible of new information as it becomes available</p>
<p><u>***Collective development of solutions by local and district stakeholder:</u> One or more local facilitators (community leaders?) to continually lead local community and district-wide workshops to help affected stakeholders develop and review options that are both widely accepted and physically viable. The facilitators need to have good local, regional and national connections, an understanding of Dynamic Adaptive Planning (See Appendix 5) and a good understanding of resourcing options (e.g. funding schemes like the government's Climate Emergency Fund and many others). Local groups need to represent local issues, e.g. Rangitata Huts, Milford Huts, Farmers, Patiti Point residents etc.</p>	<p>An evolving, documented set of viable solutions to coastal inundation and erosion which have widespread support of affected communities, individuals and organisations. Each area within the district has identified evolving solutions that are locally specific within the overall Timaru-District-Wide framework, ideally sharing those elements of solutions that will work in more than one location.</p>

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<p>*** <u>CIE Advocate</u>: Appoint an independent advocate to help stakeholders who are or will be badly affected by CIE to define their preferred options and to advocate to TDC, ECan and other legislative bodies to find ways to permit these options, even if that means reasonably ‘bending the rules’ with the express approval of elected members.</p>	<p>The preferred options of stakeholders who are or will be badly impacted by CIE have been permitted, or permitted with agreed variations, even if that permitting includes ‘bending the rules’ (but only for badly CIE-impacted stakeholders) with the express approval of elected members.</p>
<p>*** <u>Communities’ and individual’s questions</u>: Identify and answer stakeholders’ questions, initially <u>finding rough answers quickly rather than detailed answers slowly</u>. Some initial questions include:</p> <ul style="list-style-type: none"> <li>• What are the <i>likely</i> elements of the government’s Climate Change Adaptation Plan especially relating to costs (given that the Adaptation Plan probably will not be finalised till 2024)</li> <li>• What scale of inundation and erosion should we plan for given likely global heating of 3.2 degrees by 2100? (based on existing international pledges)</li> <li>• Can alternative land be made available for relocating coastal settlements (Milford Huts; Rangitata Huts) and at what cost to property owners?</li> <li>• What infrastructure would be essential for relocated settlements and who pays for it?</li> <li>• What is the cost of moving most houses at the same time (compared to the cost of moving them each at different times)?</li> <li>• Can wetlands realistically be restored, rejuvenated or created and what could be their characteristics (Public? Private food production? Mahinga kai gathering? Carbon sequestration? Other?)</li> <li>• What are other economically sustainable uses for inundated land, if any?</li> <li>• Will the main trunk line (currently also acting as a stop-bank for some properties) be abandoned or moved and how will that affect the hazards properties are exposed to</li> <li>• What’s the insurance industry’s perspective on continuing to insure properties that are prone to inundation from sea level rise and river flooding?</li> <li>• Which of the 26 Coastal Hazard Adaptation Options in the ChCh City Council report (if any) (“Catalogue of Hazard Adaptation Options”) are most likely to be viable to</li> </ul>	<p>A list of affected stakeholders’ questions plus rough, off-the-cuff ‘answers’ plus an indication of those questions where more detail is required through more formal triaging of ideas</p>

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<p>each different situation in the Timaru District?</p> <ul style="list-style-type: none"> <li>• How do the following targets and goals from the Canterbury Water Management Strategy (endorsed by all councils in Canterbury) apply to coastal inundation and erosion in the Timaru District: “By 2020: A significant protection and restoration programme is in place on the most ecologically significant river mouth or coastal lagoon in each management zone. By 2025: All coastal lagoons, hāpua and estuaries show improvement in key ecosystem health indicators compared to 2010.</li> <li>• What funding might be available to assist communities to respond to the impacts of climate change, especially coastal inundation and erosion (is funding available from the government’s large ‘Climate Emergency Fund’?)</li> <li>• How can we support the most vulnerable members of our communities?</li> <li>• What hazards exist relating to old landfills next to the Rangitata Huts?</li> <li>• Other questions are emerging all the time.</li> </ul>	
<p><u>River mouth and lagoon openings:</u> Review and optimise the location and short-to-medium term timing of river and lagoon opening operations, currently being done by ECan</p>	<p>Optimised plan for short-to-medium term river mouth and lagoon openings (ECan)</p>
<p><u>***Potential solutions:</u> Guided by the evolving information, assemble and triage (including rough costings) of CIE options (Results) for enabling the desired Uses and Benefits, optimising the net Benefits and finding solutions that are widely accepted as fair and reasonable. This will be one of the most challenging Projects and will need highly skilled facilitators.</p>	<p>A ‘CIE Solutions Report’ which defines and roughly cost-estimates (trriages) technically, socially, environmentally and culturally doable and widely acceptable solutions from the perspective of affected stakeholders. Some of the solutions may not currently be permitted by existing legislation (much of which was not designed to accommodate climate change) and some will not please everyone so all viable options need to be identified. The solutions are likely to be consistent with Dynamic Adaptive Planning, i.e. sequences of short, medium and long term actions</p>
<p><u>Community cohesion:</u> Continually share all information as widely as possible with affected stakeholders, especially when ideas and potential actions are collaborative and evolve or change compared to original expectations.</p>	<p>As many stakeholders as possible have sufficient information to make informed choices about their preferred <i>individual and shared</i> solutions to the impacts of coastal inundation and erosion. Ideally a growing consensus for actions in ways that <i>strengthen</i> rather than <i>fragment</i> communities.</p>

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<p><u>Informing other Canterbury stakeholders:</u> Continually share all information with non-affected stakeholders in the Timaru District to keep building awareness of the impacts of coastal inundation and erosion on communities and ecosystems</p>	<p>As many Timaru District residents as possible have a good understanding of the impacts of coastal inundation and erosion on communities and ecosystems</p>
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Legislation Projects-Results

<b>Legislation Projects</b>	<b>Legislation Results</b>
<p><u>Report on current legislative status:</u> Prepare and widely disseminate a report which identifies existing and anticipated legislation (statutory and non-statutory) which will enable or constrain actions on CIE</p>	<p>All affected stakeholders have (ready access to) a report on existing and anticipated legislation (statutory and non-statutory) which will enable or constrain actions on CIE</p>
<p><u>Evaluate current legality of preferred solutions:</u> Assess the 'CIE Solutions Report' to identify and document which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation.</p>	<p>A 'CIE Legislation report' defining which of the identified potential solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions, which solutions require modifications to legislation and which solutions do or do not comply with non-statutory requirements.</p>
<p><u>Legislative lobbying:</u> Lobby for the redrafting of legislation to permit the desired CIE solutions.</p>	<p>Legislation is permissive of desired CIE solutions and where legislation is prohibitive, that legislation is backed by sound logic as to why prohibitions remain</p>

Resourcing Projects-Results

<b>Resourcing Projects</b>	<b>Resourcing Results</b>
<p><u>Project selection:</u> Distil those Projects which are widely supported, Validated, worthwhile and legislatively enabled ("Viable Projects")</p>	<p>A list of widely supported, Validated, worthwhile and legislatively enabled CIE Projects ("Viable Projects")</p>
<p><u>Identify resourcing options:</u> Identify sources of resources for the viable Projects. Such resources include funding and contributions in kind and enabling processes</p>	<p>A documented list of potential resources for the viable Projects</p>
<p><u>CIE Business Cases:</u> Influenced by the 'CIE Legislation Report', distil and define in sufficient detail for resourcing and implementation ('compelling business cases'), those Validated solutions which communities wish to implement</p>	<p>A set of compelling 'CIE Business Cases' for attracting resources and guiding the implementation of Validated CIE solutions</p>
<p><u>Secure resources:</u> Submit business cases and, where realistic, secure sufficient resourcing to implement solutions</p>	<p>Resources available to implement viable Projects</p>

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#### Dissemination Projects-Results

<b>Dissemination Projects</b>	<b>Dissemination Results</b>
<u>Resource dissemination plan:</u> Determine how, and to whom, resources must be disseminated to enable effective implementation of viable Projects	A clear plan of how, and to whom, necessary resources will be disseminated for viable Projects
<u>Resource dissemination:</u> Disseminate resources to relevant stakeholders who will undertake viable asset-creating or maintaining CIE Projects and/or Use those assets	Stakeholders have the resources they need to implement viable CIE Projects and Uses

#### Capital Works Projects-Results

<b>Capital Works Projects</b>	<b>Capital Works Results</b>
<u>Viable capital works – introduction:</u> Viable capital works Projects produce the <i>necessary and sufficient</i> set of Results which will enable the desired Uses and Benefits. As at February 2023, no decisions have been made on optimal responses to coastal inundation and erosion of non-commercial land in the Timaru District. All options remain on the table and urgently need triaging (see 'Information Projects') to identify the most viable options for more-in-depth analysis. The report "Catalogue of Coastal Hazard Adaptation Options" by Christchurch City Council lists 26 options they have identified based on a global survey of options. Environment Canterbury staff are also assessing other options e.g. relating to the timing and exact location of river-mouth openings plus stakeholders' preferences are also being assessed (also an Information project). Options also need to be guided by other statutory and non-statutory requirements including the Canterbury Water Management Strategy which has been endorsed by all councils in Canterbury.	The necessary and sufficient set of physical CIE assets is in place to enable desired Uses and Benefits
<u>CIE asset maintenance:</u> Communities, organisations and individuals work collaboratively to maintain CIE capital works	CIE assets, once built, continue to be in a robust state of 'health' long after they were constructed.
<u>River mouth and lagoon openings:</u> Until longer term solutions are in place, continue with recently optimised schedule of river mouth and lagoon openings	Until longer term solutions are in place, flooding of Rangitata Huts and Milford Huts is minimised as much as can be achieved through opening river mouths and lagoons to the sea

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Many Uses of the above Results simultaneously create economic, cultural, social and environmental Benefits. In the following tables, such Benefits will be included with the Uses that created them so that for example, a Use may create economic Benefits as well as a sense of wellbeing and security (social Benefit), a sense of connection with history (cultural Benefit) and a healthier ecosystem (environmental Benefit)

#### Uses and Benefits

Uses	Benefits
<u>Food production</u> Continuing but potentially changed, sustainable and climate-friendly local food production (including employment) on land/wetlands/lagoons that is exposed to CIE	Food growers and their employees in CIE-affected areas have financially secure lives and feel good about their food production and their continuing social licence to operate
<u>Food consumption:</u> Food consumers enjoy quality, sustainably produced food from CIE-affected land at lower cost than imported food	Consumers have more money left over after purchasing food, as well as confidence that their food was sustainably produced with minimal adverse impacts on the environment/climate
<u>Ecosystem services:</u> The environment provides a wide range of ecosystem services such as coastline protection, water filtration, local weather modification, nutrient absorption, carbon sequestration, pest control (though hosting predator-species)	Increasingly healthy ecosystems, improved community well-being and sequestered carbon
<u>Tourism:</u> Local tourism and service businesses sustainably and profitably provide services to more tourists who are attracted to the enhanced ecosystems	Tourism and related business owners and staff have sustainable lifestyles. Tourists are happy with their tourism experiences (and recommend the area to others)
<u>Foraging and Mahinga Kai:</u> People continue to collect mahinga kai in protected and enhanced wetlands, lagoons and other waterways consistent with the goals and targets of the Canterbury Water Management Strategy and the Ngai Tahu Climate Change Strategy and other documents	People of all cultures have a deep sense of connection to the waterways and land that nourishes them
<u>Human Uses of ecosystems:</u> People enjoy the public spaces created or maintained through the viable CIE Projects, especially protected and restored wetlands, lagoons and other waterways. Uses include individual and community-based collection of mahinga kai, fishing, boating, swimming, holiday-living and simply 'bathing' in healthy ecosystems	Healthier and happier citizens both as individuals and as communities
<u>Thriving ecosystems:</u> Nature (plants, animals, birds, insects) thrive in increasingly healthy ecosystems	Increasingly self-repairing ecosystems due to the resumption of natural processes. Economic, social and cultural Benefits arising from improved ecosystem services and a healthier environment



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For further information and/or discussions on this draft Coastal Inundation and Erosion SubStrategy please contact:

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## SubStrategy #2: Domestic Food Resilience (DFR)

### Background

This Domestic Food Resilience SubStrategy is one of a suite of topic-specific SubStrategies that are collectively guided by the Principles of the Timaru District Climate Change Strategy. The Principles and topic-specific SubStrategies were developed with and by and for everyone in the Timaru District.

The following scenarios are based on information received so far from scientists, local authorities, residents, farmers, Mana Whenua and other stakeholders. These scenarios are unlikely to be totally accurate but may be good indications of what is probable. They are provided here as a baseline for further discussions, not as finalised scenarios.

Likely Timaru District Domestic Food Resilience scenarios in the next few decades if no action is taken

1. Reduced domestic food production due to more frequent and extreme weather events (early and late frosts; intense rainfalls; flooding; extended droughts; more frequent and more severe hailstorms; stronger winds; reduced availability of irrigation water)
2. Reduced domestic food production due to more plant and animal pests and diseases migrating into the district, possibly involving more extensive use of agrichemicals
3. Increased demand for food from many new migrants and climate refugees adding to existing populations
4. Homes and supermarkets having on average stored food to last 3 days
5. Considerably more expensive 'purchased-food' due to greatly increased fossil fuel, fertiliser and agrichemical costs and reduced availability coupled with considerably more manual labour for growing and harvesting food
6. Less than 5% of the food consumed domestically in the district continues to be grown domestically and locally with the rest sourced from elsewhere including 50% from overseas

Given point 6 above, this DFR strategy will in the short to medium term focus on improving the resilience of *domestically available food rather than domestically grown food*. This is because making the *availability* of large-scale commercially-supplied food for domestic consumption more resilient can happen much faster than making domestically-grown food production larger-scale and more resilient.

Possible Timaru District Domestic Food Resilience scenarios in the next few decades if we take action (to be developed/modified by and with our affected communities)

1. 2123 stakeholders look back 100 years and appreciate their good ancestors' actions
2. 20% of the food consumed in the district is *grown* domestically/locally and a further 30% is *grown* commercially/locally and the balance continues to be commercially-grown food imported into the district
3. On average, homes have stored food and water to sustain them for 10 days

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4. The diversity of locally grown food (domestically and commercially grown) has increased by 50% compared to 2023 to create a mixture of food sources that is more resilient to climate change
5. Supermarkets and other food suppliers hold 10-day supplies of staple foods in the District
6. 20% of food is shared or bartered within communities rather than purchased through 2023-style channels
7. Reduced use of fossil fuels and agrichemicals including fertilisers as food production has largely adopted low-input growing methods such as regenerative farming and permaculture

#### DFR Recommendations

The main recommended actions distilled from the Domestic Food Resilience tables as at April 2023 are (most important recommendations marked with \*\*\*):

1. **\*\*\*Emergency food supplies:** Identify and characterise all local commercial and domestic food sources that could be quickly made available following a disaster-level event such as massive storms or the fracturing of the Alpine Fault (AF8 scenario) and establish mechanisms for rapidly distributing the food.
2. **\*\*\*Food vulnerability:** Identify, assess and document all forms of food vulnerabilities in the Timaru District and recommend options for helping those who are most vulnerable.
3. **Local domestic food sources:** More and more people in the Timaru District are growing their own food, ranging from backyard gardens to community gardens to larger-scale food forests. This Project will identify as many sources of domestic food growing as possible and widely share stories of how and where it is being done so as to encourage and guide further growth of domestic food production
4. **Intergenerational training in food production, preparation and wellbeing:** Identify, evaluate and document intergenerational food production training options, especially hands-on in-school and young-persons' community food growing programmes learning from experienced elders
5. **Foraging:** Identify and document the scope for enabling free food foraging through establishing and maintaining food producing trees, bushes and crops on public land
6. **DFR events:** Identify, scope and disseminate a report on the likely viability and impact of public DFR events such as:
  - a. Harvest festivals
  - b. Regular free produce-tasting
  - c. Hunters/brewers/gatherers festivals
  - d. Food growing/processing demonstrations by celebrities
  - e. Food production competitions: between organisations/businesses/communities; between suburbs;
  - f. Other

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7. Collaborate with commercial food producers: Work with commercial food producers, processors and industry associations (e.g. Dairy NZ; Hort NZ) to identify, scope, inspire and document ways to increase the amount of food that is produced for local rather than international consumption

This draft Domestic Food Resilience (DFR) SubStrategy will continually evolve over many months and years as more information is collected, disseminated, reviewed and fed into viable Projects, Results, Uses and Benefits.

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Details of the evolving Projects, Results, Uses and Benefits

Information Projects-Results

Information Projects	Information Results
<p><u>Overarching role of the information Projects:</u> The overarching information project is to identify, evaluate and include/exclude information for each of the information-boxes on Projects, Results, Uses and Benefits throughout this SubStrategy. The boxes in this evolving SubStrategy currently contain information that has already been explicitly identified as relevant to this SubStrategy as well as numerous other concepts that have yet to be fully understood, evaluated and included/excluded in the SubStrategy</p>	<p>Over time, a fully populated and validated Domestic Food Resilience SubStrategy for the Timaru District</p>
<p><u>Collation of independent reports:</u> Consolidate existing independent reports on climate change, DFR and other contributing factors, success stories from elsewhere (e.g. Cuba, ChCh, Winchester) and where appropriate, produce a summary report of key information</p>	<p>A 'Climate change and DFR Independent Reports Library'. A summary report of practical examples and options that are likely to be relevant in the Timaru District</p>
<p><u>Human stakeholders' Uses and Benefits:</u> Understand and document <i>the full spectrum</i> of desired human stakeholders' Uses and Benefits for 2050, 2100 and 2150 in relation to DFR.</p>	<p>A 'DFR Uses and Benefits Report' which defines human stakeholders' full spectrum of desired Uses and Benefits to address DFR as at 2050, 2100 and 2150.</p>
<p><u>***Food vulnerability:</u> Identify, assess and document all forms of food vulnerabilities in the Timaru District and recommend options for helping those who are most vulnerable.</p>	<p>A report which describes food vulnerabilities in the Timaru District including recommended options for helping the most vulnerable communities and individuals</p>
<p><u>***Local food sources:</u> Unconfirmed reports suggest that Timaru's supermarkets hold about 3 days food in stock so if transport links are broken for extended times due to extreme weather or the alpine fault rupturing, food from usual sources will be in short supply. However there is a lot of food in the district, some ready for consumption in cool-stores and some needing processing (on-farm grain in silos, field crops and livestock). This project will identify all potential commercial and domestic food sources, their immediate useability, what emergency processing could be implemented and how such local food could be widely distributed in an emergency</p>	<p>Emergency managers such as Civil Defence understand local-food availability, its form and useability, potential emergency processing options and emergency distributions plans which they will ideally incorporate into their emergency plans</p>

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<p><u>Local domestic food sources:</u> More and more people in the Timaru District are growing their own food, ranging from backyard gardens to community gardens to larger-scale food forests. This Project will identify as many sources of domestic food growing as possible and widely share stories of how and where it is being done so as to encourage and guide further growth of domestic food production</p>	<p>Readily accessible information on many examples of domestic-scale food production in the Timaru District. This is likely to be in the form of brochures, web-pages and public visits and tours of domestic-food-growing sites to share and expand community-wide knowledge of non-commercial food production</p>
<p><u>Intergenerational training in food production, preparation and wellbeing:</u> Identify, evaluate and document intergenerational food production training options, especially hands-on in-school and young-persons' community food growing programmes learning from experienced elders</p>	<p>Existing and potential training providers have a good understanding of the viability, scalability and potential impacts on wellbeing of intergenerational food production and preparation training options (and ideally implement some of the options)</p>
<p><u>***Foraging:</u> Identify and document the scope for enabling free food foraging through establishing and maintaining food producing trees, bushes and crops on public land</p>	<p>Managers of public lands understand the scope (locations, scale, viability) and the viability for public food foraging on public land and where appropriate are inspired to enable more food foraging</p>
<p><u>Demonstrations and training:</u> Identify, evaluate and documents options for establishing demonstration domestic food-growing sites and food growing training programmes</p>	<p>Relevant DFR stakeholders understand the viable options for establishing demonstration domestic food-growing sites and food growing training programmes</p>
<p><u>Alternative foods:</u> Identify alternative foods that could be grown in the Timaru District and evaluate the viability and impact of producing them here and summarise those that appear most viable</p>	<p>Potential food producing stakeholders understand the potential viability of producing alternative foods in the Timaru District and where appropriate are inspired to produce them</p>
<p><u>DFR events:</u> Identify, scope and disseminate a report on the likely viability and impact of public DFR events such as:</p> <ol style="list-style-type: none"> <li>1. Harvest festivals</li> <li>2. Regular free produce-tasting</li> <li>3. Hunters/brewers/gatherers festivals</li> <li>4. Food growing/processing demonstrations by celebrities</li> <li>5. Food production competitions: between organisations/businesses/communities; between suburbs;</li> <li>6. Other</li> </ol>	<p>Interested stakeholders understand the likely viability and impact of a range of public DFR events and where appropriate are inspired to make them happen</p>

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<p><u>Communications and community cohesion:</u> Continually share all DFR information as widely as possible with affected stakeholders, especially when ideas and potential actions are collaborative and evolve or change compared to original expectations. Some key messages include:</p> <ol style="list-style-type: none"> <li>1. Local food producing, processing and consuming can be very rewarding in many ways</li> <li>2. The Timaru District is one of the luckiest areas on the planet for food growing – we are living in a natural food basket</li> <li>3. Food growing can range from high input monoculture to lower input diverse and wild food production and everything in between</li> <li>4. Our expected ‘energy-descent’ future will require local food production – it will not be optional – so developing the necessary local skills and resources will be essential</li> <li>5. In all likely short to medium term scenarios, the majority of most people’s food will be produced by ‘food producers’ not by the general public</li> <li>6. Consume less and waste less</li> </ol>	<p>As many stakeholders as possible have sufficient information to make informed choices about their preferred <i>individual and shared</i> solutions to DFR. Ideally a growing consensus for actions in ways that <i>strengthen</i> rather than <i>fragment</i> communities.</p>
<p><u>Collaborate with commercial food producers:</u> Work with commercial food producers, processors and industry associations (e.g. Dairy NZ; Hort NZ) to identify, scope, inspire and document ways to increase the amount of food that is produced for local rather than international consumption</p>	<p>More commercial food producers are inspired to implement the ideas in a report which identifies, scopes and documents ways to increase the amount of food that is produced for local rather than international consumption</p>
<p><u>Assess other options:</u> Assess, produce and widely disseminate a report on the viability, scale and potential impact of many other DFR suggestions including the following (a mix of Projects and Uses that need to be defined in more detail):</p> <ol style="list-style-type: none"> <li>1. Food boxes on fences</li> <li>2. Community gardens</li> <li>3. Allotments</li> <li>4. Eco-villages</li> <li>5. Multi-dwelling intense food producing properties</li> <li>6. Food co-ops</li> <li>7. Permaculture and food forests</li> <li>8. Sharing of DFR success stories</li> <li>9. Vlogs/Blogs on local DFR</li> <li>10. Growing foods with minimal greenhouse gas emissions</li> </ol>	<p>Many Timaru District stakeholders have a more in-depth understanding of the viability, scale and potential impact of a wide range of DFR actions so are better empowered to take DFR actions</p>

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<ol style="list-style-type: none"> <li>11. Enhancing the nutritional content of locally grown foods e.g. to enhance selenium and iodine contents (both deficient in many NZ soils)</li> <li>12. Developing optimum food-diversity and ‘sheltered’ food production systems to increase resilience to extreme weather events</li> <li>13. Closed-loop food production (recycling or composting all organic wastes including human waste to reduce loss of nutrients like phosphates as mined phosphates are rapidly running out)</li> <li>14. Subscription-service food box systems</li> <li>15. Promote acceptance and enjoyment of food seasonality and variability</li> <li>16. Crop, plant, seed and food exchanges</li> <li>17. Community DFR forums, discussion groups and workshops</li> <li>18. Supply of food-growing and food-processing kits (growing-pods, seeds and seedlings, information leaflets, in-home DFR mentoring)</li> <li>19. Combined venues for DFR, appliance and bike repairs, training, friendship, café</li> <li>20. Food growing in front yards and road berms</li> <li>21. Neighbourhood food and skill sharing</li> <li>22. Reality TV shows on how to share resources, DFR, what other groups are doing</li> <li>23. ‘Adopt a gardener’ where skilled gardeners mentor those who want to develop their own DRF</li> <li>24. Redevelop market gardens that used to exist in the Timaru District</li> <li>25. Enable more and more frequent farmers markets</li> <li>26. A website where people who are motivated to address DFR and have time, money, resources, knowledge, skills and enthusiasm can be matched with people who could use DFR help</li> </ol>	
<p><u>DFR solutions:</u> Distil the most viable solutions from all the above DFR information projects, summarise them and disseminate the summary widely to Timaru District stakeholders</p>	<p>Time District Stakeholders are motivated to confidently implement the most viable options for improving Domestic Food Resilience in the Timaru District</p>



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#### Legislation Projects-Results

<b>Legislation Projects</b>	<b>Legislation Results</b>
<u>Report on current legislative status:</u> Prepare and widely disseminate a report which identifies existing and anticipated legislation (statutory and non-statutory) which will enable or constrain actions on DFR	All affected stakeholders have (ready access to) a report on existing and anticipated legislation (statutory and non-statutory) which will enable or constrain actions on DFR
<u>Evaluate current legality of preferred solutions:</u> Assess the 'DFR Solutions Report' to identify and document which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation.	A 'DFR Legislation report' defining which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions, which solutions require modifications to legislation and which solutions do or do not comply with non-statutory requirements.
<u>Legislative lobbying:</u> Lobby for the redrafting, where necessary, of legislation to permit the desired DFR solutions.	Legislation is permissive of desired DFR solutions and where legislation is prohibitive, that legislation is backed by sound logic as to why prohibitions remain

#### Resourcing Projects-Results

<b>Resourcing Projects</b>	<b>Resourcing Results</b>
<u>Project selection:</u> Distil those Projects which are widely supported, Validated, worthwhile and legislatively enabled ("Viable Projects")	A list of widely supported, Validated, worthwhile and legislatively enabled DFR Projects ("Viable Projects")
<u>Identify resourcing options:</u> Identify sources of resources for the viable Projects. Such resources include funding and contributions in kind and enabling processes	A documented list of potential resources for the viable Projects
<u>DFR Business Cases:</u> Influenced by the 'DFR Legislation Report' distil and define in sufficient detail for resourcing and implementation ('compelling business cases'), those Validated solutions which communities wish to implement.	A set of compelling 'DFR Business Cases' for attracting resources and guiding the implementation of Validated DFR solutions
<u>Secure resources:</u> Submit business cases and, where realistic, secure sufficient resourcing to implement solutions	Resources available to implement viable Projects

#### Dissemination Projects-Results

<b>Dissemination Projects</b>	<b>Dissemination Results</b>
<u>Resource dissemination plan:</u> Determine how, and to whom, resources must be disseminated to enable effective implementation of viable Projects	A clear plan of how, and to whom, necessary resources will be disseminated for viable Projects
<u>Resource dissemination:</u> Disseminate resources to relevant stakeholders who will undertake viable asset-creating or maintaining DFR Projects and/or Use those assets	Stakeholders have the resources they need to implement viable DFR Projects and Uses

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#### Capital Works Projects-Results

Capital Works Projects	Capital Works Results
<u>Viable capital works – introduction:</u> Viable capital works Projects produce the necessary and sufficient set of Results which will enable the desired Uses and Benefits. As at February 2023, no decisions have been made on optimal responses to Domestic Food Resilience in the Timaru District. All options remain on the table and urgently need triaging (see 'Information Projects') to identify the most viable options for more-in-depth analysis.	The necessary and sufficient set of physical DFR assets is in place to enable desired Uses and Benefits
<u>DFR asset maintenance:</u> Communities, organisations and individuals work collaboratively to maintain DFR capital works	DFR assets, once built, continue to be in a robust state of 'health' long after they were constructed.

Many Uses of the above Results simultaneously create economic, cultural, social and environmental Benefits. In the following tables, such Benefits will be included with the Uses that created them so that for example, a Use may create economic Benefits as well as a sense of wellbeing and security (social Benefit), a sense of connection with history (cultural Benefit) and a healthier ecosystem (environmental Benefit)

#### Uses and Benefits

Uses	Benefits
<u>Food production and consumption:</u> Continuing <i>but potentially changed</i> , sale and consumption of sustainable and climate-friendly locally produced food including associated employment	Consumers have more money left over after growing or purchasing food, as well as confidence that their food was sustainably produced with minimal adverse impacts on the environment/climate. Food growers and their employees in climate-affected areas have financially secure lives and feel good about their food production and their continuing social licence to operate
<u>Mahinga Kai and foraging:</u> People continue to forage and collect mahinga kai in protected and enhanced wetlands, lagoons, other waterways and public lands consistent with the goals and targets of the Canterbury Water Management Strategy and the Ngai Tahu Climate Change Strategy and other documents	People from all cultures feel a close association with the land, wetlands, lagoons, other waterways and public lands
<u>Human Uses of ecosystems:</u> People enjoy the public spaces created or maintained through the viable DFR Projects, especially public land which is growing food	Healthier and happier citizens both as individuals and as communities

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<p><u>Thriving ecosystems</u>: Nature (plants, animals, birds, insects) thrive in increasingly healthy, food producing public and private ecosystems</p>	<p>Increasingly self-repairing ecosystems due to the resumption of natural processes. Economic, social and cultural Benefits arising from improved ecosystem services and a healthier environment</p>
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For further information and/or discussions on this draft Domestic Food Resilience SubStrategy please contact:

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### SubStrategy #3: Low Emission Resilient Transport (LERT)

#### Background

This Low Emission Resilient Transport (LERT) SubStrategy is one of a suite of topic-specific SubStrategies that are collectively guided by the Principles of the Timaru District Climate Change Strategy. The Principles and topic-specific SubStrategies were developed with and by and for everyone in the Timaru District.

The following scenarios are based on information received so far from scientists, local authorities, residents, farmers, Mana Whenua and other stakeholders. These scenarios are unlikely to be totally accurate but may be good indications of what is probable. They are provided here as a baseline for further discussions, not as finalised scenarios.

This LERT SubStrategy acknowledges and parallels the work of a Canterbury Regional Transport Committee which includes representatives from all Canterbury District Councils, Environment Canterbury and Waka Kotahi who are focused on infrastructure for better transport options.

Likely Timaru District Low Emission Resilient Transport scenarios in the next few decades if no action is taken

1. A truck and trailer unit transporting 40 tonnes of food to Timaru supermarkets will continue to emit the same level of GHG emissions as 5 SUVs
2. Based on current purchasing habits it will take 2-3,000 trips by citizens to collect and transport home the same 40 tonnes of food, thereby emitting several hundred times the emissions of the trucks that brought the food to the Timaru District
3. Around 95% of food consumed in the Timaru District will continue to be imported from outside the District with 50% transported from overseas
4. Emissions associated with transporting food to and from farmers markets will be significantly higher on a per-kilo basis than super-market foods (although other emissions associated with food growing and storage may be lower)
5. Fossil fuels are becoming scarce and too expensive for most citizens
6. The main trunk railway line will no longer function, with the added challenge that it will no longer be maintained as a stop bank to protect vulnerable property such as farms and the Redruth landfill
7. Most roads will continue to be too dangerous for active forms of transport
8. Heavy vehicle transport will continue to carry (essential?) goods that our communities want and need (as distinct from a substantial percentage of non-commercial transport which is not essential e.g. too-frequent trips to supermarkets, taking children to school, travel to holiday destinations etc)
9. A small percentage of Timaru residents use active forms of transport while many more would use active transport if easier-to-use options were both available and safer
10. The District's low population density makes car travel continue to be a preferred option for many people

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11. Many people in the District are still not convinced that they need to address GHG emissions from transport
12. Transport operators continue to make multiple, high emission, small deliveries to retailers as part of an ongoing just-in-time delivery system

Given points 3, 8 and 9 above, this LERT SubStrategy will in the short to medium term focus on reducing non-commercial transport emissions because there only a few non-essential commercial transport activities but many non-essential domestic transport activities.

Possible Timaru District Low Emission Resilient Transport scenarios in the next few decades if we take action (to be developed/modified by and with our affected communities)

1. 2123 stakeholders look back 100 years and appreciate their good ancestors' actions
2. Over 90% of citizens accept that transport GHG emissions need to continue to be slashed
3. Central government has introduced and enforced legislation to discourage domestic fossil fuel use and encourage eVs, active transport and less overall travel
4. Fossil fuels have become scarce and too expensive for many citizens
5. Many Timaru District stakeholders are using a range of locally-designed and implemented, active transport options that are *both easy and safe* to use. These options include safer 'social roads' and tracks, e-bikes and PodBikes (or similar), other electric vehicles, cycling, walking, public transport and other yet-to-be-identified options
6. Many Timaru District stakeholders have reduced their number of trips to buy food and other goods by growing their own food, stocking up with larger purchases and buying fewer, but more durable, products
7. Retailers hold more stock so that instead of relying on high-emission just-in-time deliveries of small quantities of goods they use lower-emission larger deliveries of goods
8. Commercial transport operators have reduced their emissions through the use of electric trucks and forklifts, fewer small deliveries, more efficient internal combustion engine vehicles, slower speeds and other evolving options
9. The main trunk line has been either relocated or somehow (!) protected from coastal erosion and inundation so continues to operate and act as a stop-bank protecting some properties and infrastructure
10. Transport operators use a new inland 'port' for goods storage due to the storage areas south of the port having been inundated/eroded, thereby possibly requiring bursts of intense through-town heavy truck movements when ships are loading or unloading
11. Timaru airport stays small as people travel less
12. Due to more food grown locally, heavy vehicle food transport requirements are lower
13. Primeport Timaru continues to be a significant import/export terminal

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LERT Recommendations

The main recommended actions distilled from the Low Emission Resilient Transport SubStrategy as at April 2023 are:

- **\*\*\*Determine people’s willingness to act on LERT:** Understand what people will *actually* do, both now and in the future and at what scale, if the right infrastructure and environment were put in place e.g.
  - redesigned/rebuilt ‘pro-social transport corridors/roads/paths’ with vehicle restrictions that make active transport safer
  - better/different public transport
  - easier and more informed local (commercial and domestic) production of food and other currently-imported products leading to less demand for heavy truck transport
  -
- **\*\*\* Campaign to promote climate friendly transport options that do not need new infrastructure:** Campaign to encourage people to halve their trips for buying consumables (e.g. trips to supermarkets) by buying more on each trip plus travelling less for work and holidays
- Understand the impacts of likely fossil-fuel scarcity and increased prices
- Continue to develop public transport options that align with people’s transport desires
- Locally (commercially and domestically) produce more food and other locally consumed goods

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Information Projects-Results

Information Projects	Information Results
<p><u>Independent reports</u> Consolidate existing independent reports on climate change, LERT and other contributing factors</p>	<p>A 'LERT Independent Reports Library'</p>
<p><u>Willingness to act</u> Understand and document the full spectrum of desired stakeholders' Uses and Benefits for 2050, 2100 and 2123 and what stakeholders are genuinely prepared to do if enabled to take LERT actions. This includes determining people's current understanding of issues and then improving awareness and motivation to take actions.</p>	<p>A 'LERT Uses and Benefits Report' which defines Timaru District's stakeholders' full spectrum of desired Uses and Benefits in relation to LERT including their willingness to genuinely take LERT actions, their current levels of understanding of LERT issues and what further information they need to become sufficiently informed and motivated to take LERT actions</p>
<p><u>Stakeholders' questions:</u> Identify and answer stakeholders' questions, initially <i>finding rough answers quickly rather than detailed answers slowly</i>. Some initial questions include:</p> <ul style="list-style-type: none"> <li>• What are the <i>likely</i> elements of the government's Climate Change Adaptation Plan especially relating to costs (given that the Adaptation Plan probably will not be finalised till late 2024)?</li> <li>• What will be the impacts on the likely reductions in future fossil fuel availability and increased prices?</li> <li>• Which stakeholder actions will make the biggest reductions in Timaru District's greenhouse gas emissions                         <ul style="list-style-type: none"> <li>○ Modest actions by many stakeholders?</li> <li>○ Big actions by a few stakeholders?</li> <li>○ Other?</li> </ul> </li> </ul>	<p>A list of affected stakeholders' questions plus rough, quickly obtained answers plus an indication of those questions where more detail is required. Where possible, sufficiently detailed information obtained to guide implementation decisions by all stakeholders.</p>
<p><u>Triage options:</u> Guided by the evolving information, assemble and triage (including rough costings) of LERT options (Results) for enabling the desired Uses and Benefits, optimising the net Benefits and finding solutions that are widely accepted as fair and reasonable. This will be one of the most challenging Projects and will need highly skilled facilitators.</p>	<p>A 'LERT Solutions Report' which defines and roughly cost-estimates (trriages) technically, socially, environmentally and culturally doable and widely acceptable solutions from the perspective of affected stakeholders. Some of the solutions may not currently be permitted by existing legislation (much of which was not designed to accommodate climate change) and some will not please everyone so all viable options need to be identified</p>
<p><u>Business cases:</u> Guided by the 'LERT Legislation Report' (see next set of Projects/Results), distil and define in sufficient detail for resourcing and implementation ('compelling business cases'), those Validated solutions which communities wish to implement.</p>	<p>A set of compelling 'LERT Business Cases' for attracting resources and guiding implementation of Validated LERT solutions</p>

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Legislation Projects-Results

<b>Legislation Projects</b>	<b>Legislation Results</b>
<u>Assess legality of solutions:</u> Assess the ‘LERT Solutions Report’ to identify and document which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation e.g. to include compulsion to act.	A ‘LERT Legislation report’ on which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation.
<u>Legislatively enable solutions:</u> Wherever feasible, redraft legislation to permit and/or compel the desired LERT solutions.	Legislation is permissive and/or compels desired LERT solutions and where legislation is prohibitive, that legislation is backed by sound logic as to why prohibitions remain

Resourcing Projects-Results

<b>Resourcing Projects</b>	<b>Resourcing Results</b>
<u>Resourcing Projects:</u> Submit LERT business cases to agencies with funding and resources and, where realistic, secure sufficient resourcing to implement solutions	Resources available to implement compellingly convincing LERT solutions

Dissemination Projects-Results

<b>Dissemination Projects</b>	<b>Dissemination Results</b>
<u>Who needs to know?</u> Determine how, and to whom, resources must be disseminated to enable effective implementation of desired LERT solutions	A clear plan of how, and to whom, necessary resources will be disseminated to enable the implementation of LERT solutions
<u>Disseminate resources:</u> Disseminate resources to relevant stakeholders who will undertake asset-creating LERT Projects and/or Use the assets	Stakeholders have the resources they need to implement desired LERT Projects and Uses

Capital Works Projects-Results

<b>Capital Works Projects</b>	<b>Capital Works Results</b>
<u>Build LERT infrastructure and systems</u> Capital works Projects produce the necessary and sufficient set of LERT Results which will enable the desired (and ideally also ‘easy’) Uses and Benefits	The necessary and sufficient set of physical LERT assets is in place to enable desired (and ideally also ‘easy’) Uses and Benefits
<u>Potential Projects/Uses as proposed by stakeholders but not yet assessed:</u> <ul style="list-style-type: none"> <li>Public competitions e.g. youth competitions to determine their LERT visions for the District</li> <li>Update/expand grid supplies to resiliently charge many more eVs</li> </ul>	



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<ul style="list-style-type: none"> <li>• Continue to refine MyWay to make it more user-friendly (e.g. more regular, easier booking, more widely promoted etc)</li> <li>• Add a public transport network to serve Washdyke area</li> <li>• Make on-line purchasing and delivery of groceries easier</li> <li>• Change legislation to permit small electric vehicles (e.g. PodBikes) on footpaths/other paths/roads</li> <li>• Reduce international air travel in all forms</li> <li>• Work from home more often</li> <li>• Buy less stuff in general and make sure it is durable and repairable</li> <li>• Promote feel-good stories on LERT</li> <li>• Use drones for surveying roads, power lines instead of people in vehicles</li> <li>• More cycleways especially to industrial and commercial areas</li> <li>• Separate cycleways from roads</li> <li>• Make carpooling easier e.g. with website to connect people</li> <li>• Enable passenger rail to and from Christchurch and Dunedin</li> <li>• Streets-for-people projects (also other Projects run by TDC with Waka Kotahi funding)</li> <li>• Work towards walkable '15 minute neighbourhoods'</li> <li>• Enable more coastal shipping coupled with local heavy vehicle transport</li> <li>• More local food distribution options (more shops in residential areas) rather than small number of supermarkets accessed primarily by car</li> <li>• More school buses/cycling instead of travel to and from school by car</li> <li>• Use Zoom/Teams more instead of travelling to meetings</li> <li>• Focus public transport more on health and LERT and less on collecting fares</li> <li>• Free continuous transport up and down the main street</li> </ul>	
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Many Uses of the above Results simultaneously create economic, cultural, social and environmental Benefits. In the following tables, such Benefits will be included with the Uses that created them so that for example, a Use may create economic Benefits as well as a sense of wellbeing and security (social Benefit), a sense of connection with history (cultural Benefit) and a healthier ecosystem (environmental Benefit)

Uses and Benefits

<b>Uses</b>	<b>Benefits</b>
Commercial transport operators are using lower emission vehicles	Savings in Emission Trading System (ETS) credits and lower fuel consumption Healthier people and environments through lower GHG/PM5 emissions also mitigating climate change
Citizens make greater use of public transport instead of private vehicles	Reduced cost to citizens, lower infrastructure costs such as parking spaces/road upgrades (due to fewer vehicles) Healthier people and environments through lower GHG/PM5 emissions also mitigating climate change
Retailers order larger shipments and hold more stock so as to minimise transport costs	Lower transport costs to retailers (but increased storage costs) Healthier people and environments through lower GHG/PM5 emissions also mitigating climate change

For further information and/or discussions on this draft Low Emission Resilient Transport SubStrategy please contact:

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#### SubStrategy #4: Domestic Water Resilience (DWR) SubStrategy

##### Background

This Domestic Water Resilience SubStrategy is one of a suite of topic-specific SubStrategies that are collectively guided by the Principles of the Timaru District Climate Change Strategy. The Principles and topic-specific SubStrategies were developed with and by and for everyone in the Timaru District.

Timaru District stakeholders originally identified the broader topic of 'Water Resilience' as a priority SubStrategy. However, it quickly became clear that Domestic Water Resilience and 'Nature's Water Resilience' (i.e. rivers, lakes, wetlands etc) were both large topics, each requiring their own SubStrategy. The following SubStrategy is for Domestic Water Resilience with the topic of Nature's Water Resilience not yet addressed as a SubStrategy (as at April 2023).

Domestic Water Resilience relates to the '3-waters' of: water supply, wastewater management and stormwater management. While 'protection of source water' would logically be a '4<sup>th</sup>-water', this source protection will be included in the Natures' Water Resilience SubStrategy if/when it is created. Given that a large percentage of DWR Projects will be led by Timaru District Council and potentially by Environment Canterbury, this DWR SubStrategy needs to be rigorously assessed and refined in partnership with these agencies.

The following scenarios are based on information received so far from scientists, local authorities, residents, farmers, Mana Whenua and other stakeholders. These scenarios are unlikely to be totally accurate but may be good indications of what is probable. They are provided here as a baseline for further discussions, not as finalised scenarios.

Likely Timaru District Domestic Water Resilience scenarios in the next few decades if no action is taken

1. Greatly increased demand for water and food from many new migrants and climate refugees adding to existing populations
2. Reduced and more erratic domestic water availability and more-difficult-to-treat source water as more intense floods damage water sources and increase sediment loads
3. Less resilient domestic food production due to reduced availability and reliability of domestic irrigation water and more frequent and extreme weather events (early and late frosts; intense rainfalls; flooding; extended droughts; more frequent and more severe hailstorms; stronger winds)
4. More flooding of homes and properties as more intense storms overwhelm existing rain water and river infrastructures
5. Waste-water systems overwhelmed by a greatly increased population of new climate-refugees and migrants
6. Nutrient-rich waste water continues to be discharged to the ocean as it contains too many impurities to be used on land

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Under current legislation, the infrastructure for above topics are primarily the responsibility of Timaru District Council and Environment Canterbury. However, for future scenarios to be effective, Timaru District stakeholders will need to significantly change their approaches to water use and treat it as the precious taonga that it is, recognising and respecting *te mana o te wai*.

Possible Timaru District Domestic Water Resilience scenarios in the next few decades if we take action (to be developed/modified by and with our affected communities)

1. 2123 stakeholders look back 100 years and appreciate their good ancestors' actions
2. The majority of Timaru District citizens recognise and respect Te Mana o Te Wai and treat water with greater care
3. Water meters and associated charges for high water usage guide citizens to use less water with the result that average per-person water use has fallen from 312 litres (which is above the 2023 national average of 280 litres) to 140 litres per day, thus enabling enough water to be provided from existing sources to the growing climate-change-refugee community
4. Source-water protection zones are better designed and protected so that less water treatment is required
5. Urban water supplies are more decentralised so that loss of one or two storage tanks does not compromise overall supplies
6. On average, homes have enough water stored in council-approved home rainwater tanks to sustain them for 10 days and to use for domestic food growing of lower-water-demand crops
7. More shade trees in the Timaru District's urban areas reduce local temperatures and water demand
8. Built-up areas in the District are increasingly based on the concept of 'sponge-cities', thereby allowing stormwater to soak into the ground or be held temporarily in swales, ponds and rain gardens
9. Improved catchment management, especially widespread native vegetation and riparian planting plus swales and upstream wetlands, has reduced flood peaks, increased minimum flows and maintained cleaner and more easily treatable water for domestic use (basically "Slow the Water Down")
10. Solar powered desalination plants and other forms of water treatment have been evaluated and implemented where proven to be viable
11. Citizens and industries are much more careful about what they flush into the waste water system so that nutrient-rich liquids and solids can be safely extracted and used for irrigation and as fertilisers, rather than being wastefully discharged into the ocean
12. Citizens read and copy numerous widely shared stories of good water usage
13. Citizens are broadly supportive of the forms of treatment used for maintaining the safety of domestic water supplies
14. Water is not wasted by irrigating areas that are naturally dry or where irrigation water would be rapidly lost to groundwater
15. TDC/ECan have water management systems in place for both long term water resilience and also short term disaster management
16. Industrial waste water volumes are half what they were in 2023

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17. Water allocations are prioritised based on their contributions to Timaru Communities' four wellbeings (environmental, cultural, social and economic) while recognising that if the environment is unhealthy, the other 3 wellbeings will be compromised
18. Water supplies and systems continue in public ownership
19. Where possible, restored natural overland flow paths are reducing localised flooding
20. Central government has banned the release into the environment of persistent 'forever' chemicals

DWR Recommendations

The main recommended actions distilled from the Domestic Water Resilience SubStrategy are:

- **\*\*\* TDC municipal and community water supplies:** TDC to continue its programme of upgrading water treatment facilities and installing water meters to help maintain water quality and reduce consumption
- **\*\*\* Property-based water management:** Timaru District stakeholders increasingly manage water on their properties through a mix of reduced in-house consumption, rainwater tanks, lower-irrigation-demand plants and increased on-site absorption of rainwater

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Information Projects-Results

Information Projects	Information Results
<p><u>Independent reports</u> Consolidate existing independent reports on climate change, DWR and other contributing factors</p>	<p>A 'DWR Independent Reports Library'</p>
<p><u>Local authority Projects:</u> Because many Projects in the DWR SubStrategy will be led by local authorities, this SubStrategy needs to be reviewed and updated by TDC and ECan</p>	<p>An updated DWR SubStrategy that has been refined by the local authorities that have primary responsibility for 3 waters</p>
<p><u>Willingness to act</u> Understand and document the full spectrum of desired stakeholders' Uses and Benefits for 2050, 2100 and 2123 and what stakeholders are genuinely prepared to do if enabled to take DWR actions. This includes determining people's current understanding of issues and then improving awareness and motivation to take actions.</p>	<p>A 'DWR Uses and Benefits Report' which defines Timaru District's stakeholders' full spectrum of desired Uses and Benefits in relation to DWR including their willingness to genuinely take DWR actions, their current levels of understanding of DWR issues and what further information they need to become sufficiently informed and motivated to take DWR actions</p>
<p><u>Stakeholders' questions:</u> Identify and answer stakeholders' questions, initially <i>finding rough answers quickly rather than detailed answers slowly</i>. Some initial questions include:</p> <ul style="list-style-type: none"> <li>• What are the <i>likely</i> elements of the government's Climate Change Adaptation Plan especially relating to costs (given that the Adaptation Plan probably will not be finalised till late 2024)?</li> <li>• What will be the impacts on the likely reductions in future fossil fuel availability and increased prices?</li> <li>• Which stakeholder actions will make the biggest reductions in Timaru District's domestic water consumption</li> <li>• What are my options for adding rainwater tanks to my property?</li> <li>• How do I increase the 'sponginess' of my property so it absorbs more rainwater rather than letting it run-off as storm water?</li> <li>• Why do TDC's water supplies contain chlorine? (the answer is clear but it is not widely known in Timaru District communities)</li> <li>• Why can't we just have clean untreated water? (ditto)</li> <li>• What does Te Mana o te Wai mean both philosophically and in practice? (ditto)</li> <li>• Will we have to pay more when we have water meters? (ditto)</li> <li>• How should we change what we discharge into our home waste water system so that</li> </ul>	<p>A list of affected stakeholders' questions plus rough, quickly obtained answers plus an indication of those questions where more detail is required. Where possible, sufficiently detailed information obtained to guide implementation decisions by all stakeholders.</p>

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<p>the waste can be treated and used for fertiliser and irrigation?</p> <ul style="list-style-type: none"> <li>• What is an 'overland flow path' and what will it mean to me to 'restore overland flow paths'?</li> </ul>	
<p><u>Triage options:</u> Guided by the evolving information, assemble and triage (including rough costings) of DWR options (Results) for enabling the desired Uses and Benefits, optimising the net Benefits and finding solutions that are widely accepted as fair and reasonable.</p>	<p>A 'DWR Solutions Report' which defines and roughly cost-estimates (trriages) technically, socially, environmentally and culturally doable and widely acceptable solutions from the perspective of affected stakeholders. Some of the solutions may not currently be permitted by existing legislation (much of which was not designed to accommodate climate change) and some will not please everyone so all viable options need to be identified</p>
<p><u>TDC business cases:</u> TDC staff continue to develop and present compelling business cases for the management of municipal and community water supplies, waste water treatment and discharge (including potentially recovering nutrients and producing irrigation water) and storm-water</p>	<p>A set of compelling 'DWR Business Cases' for attracting resources and guiding implementation of Validated DWR solutions</p>
<p><u>Other business cases:</u> Various stakeholders including local authorities prepare business cases for direct and indirect DWR Projects such as (suggested by Timaru District stakeholders):</p> <ul style="list-style-type: none"> <li>• tree planting (for cooling urban areas and as riparian planting to slow down run-off and cool rivers)</li> <li>• researching options for using treated solid and liquid wastes for fertilisers and irrigation</li> <li>• desalination plants</li> <li>• campaigns to promote better uses of domestic water and more care with waste water</li> <li>• reduced industrial uses of municipal water</li> <li>• better mixing of industrial waste streams so they are more amenable to nutrient and water recovery and use</li> <li>• lobbying central and local government to ban forever-chemicals and other pollutants from entering fresh-water and wastewater systems</li> </ul>	<p>A range of compelling business cases for improving all forms of urban water management in the Timaru District</p>

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<p><u>Private business cases:</u> Home and business owners prepare business cases for DWR projects on their own properties ready for presentation to banks, funding agencies and potentially to community groups who collectively want to enable better DWR. Note that 'business cases' should address all 4 well-beings, not just economic wellbeing</p>	<p>Private DWR business cases ready to present to funders, banks and community groups</p>
---	---

Legislation Projects-Results

<p><b>Legislation Projects</b></p>	<p><b>Legislation Results</b></p>
<p><u>Assess legality of solutions:</u> Assess the 'DWR Solutions Report' to identify and document which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation e.g. to include compulsion to act.</p>	<p>A 'DWR Legislation report' on which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation.</p>
<p><u>Legislatively enable solutions:</u> Wherever feasible, redraft legislation to permit and/or compel the desired DWR solutions.</p>	<p>Legislation is permissive and/or compels desired DWR solutions and where legislation is prohibitive, that legislation is backed by sound logic as to why prohibitions remain</p>

Resourcing Projects-Results

<p><b>Resourcing Projects</b></p>	<p><b>Resourcing Results</b></p>
<p><u>Resourcing Projects:</u> Submit DWR business cases to agencies with funding and resources and, where realistic, secure sufficient resourcing to implement solutions</p>	<p>Resources available to implement compellingly convincing DWR solutions</p>

Dissemination Projects-Results

<p><b>Dissemination Projects</b></p>	<p><b>Dissemination Results</b></p>
<p><u>Who needs to know?</u> Determine how, and to whom, resources must be disseminated to enable effective implementation of desired DWR solutions</p>	<p>A clear plan of how, and to whom, necessary resources will be disseminated to enable the implementation of DWR solutions</p>
<p><u>Disseminate resources:</u> Disseminate resources to relevant stakeholders who will undertake asset-creating DWR Projects and/or Use the assets</p>	<p>Stakeholders have the resources they need to implement desired DWR Projects and Uses</p>



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#### Capital Works Projects-Results

Capital Works Projects	Capital Works Results
<u>Build DWR infrastructure and systems</u> TDC's '3-waters' capital works Projects produce the necessary and sufficient set of DWR Results which will enable the desired (and ideally also 'easy') Uses and Benefits	The necessary and sufficient set of physical DWR '3-waters' assets is in place to enable desired (and ideally also 'easy') Uses and Benefits
<u>Potential Projects as proposed by stakeholders but not yet assessed:</u> <ul style="list-style-type: none"> <li>Public competitions e.g. youth competitions to determine their DWR visions for the District</li> <li>Promote feel-good stories on DWR</li> <li>More local food production using home-stored rainwater (a 'Project' to establish stored rainwater and home food growing, a 'Use' to continue doing it)</li> <li>Reduce areas of municipal gardens and berms that require watering by planting more shade trees and plants requiring minimal water</li> </ul>	An as-yet-not-defined set of Results depending on which Projects can be compellingly demonstrated to be worthwhile

Many Uses of the above Results simultaneously create economic, cultural, social and environmental Benefits. In the following tables, such Benefits will be included with the Uses that created them so that for example, a Use may create economic Benefits as well as a sense of wellbeing and security (social Benefit), a sense of connection with history (cultural Benefit) and a healthier ecosystem (environmental Benefit)

#### Uses and Benefits

Uses	Benefits
Timaru District stakeholders carefully use and discharge municipal water, stormwater and waste water helped by water metering, raised awareness and an understanding of Te mana o te wai.	Savings in the cost of providing municipal water services Reduced storm-water run-off 'Cleaner' waste water that is more amenable to treating for irrigation and fertilisers
Timaru District stakeholders use rainwater for domestic purposes such as food growing, car washing, swimming pools (instead of municipal water)	Lower costs to stakeholders Reduced municipal water consumption and hence reduced costs More domestically-grown food available
More Timaru District stakeholders use dry composting toilets to produce solid waste that can be safely used for non-food plants	Reduced load on municipal waste systems. 'Free' nutrients for plants
Timaru District stakeholders enjoy shady cool streets due to extensive planting of shade trees	Stakeholders are healthier due to less heat stress

For further information and/or discussions on this draft Domestic Water Resilience SubStrategy please contact: Dr Phil Driver, [phildriver@openstrategies.com](mailto:phildriver@openstrategies.com), 021 0236 5861

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#### SubStrategy #5: Personal Climate Actions SubStrategy

##### Background

This Personal Climate Actions (PCA) SubStrategy is one of a suite of topic-specific SubStrategies that are collectively guided by the Principles of the Timaru District Climate Change Strategy. The Principles and topic-specific SubStrategies were developed with and by and for everyone in the Timaru District.

'Personal Climate Actions' describe actions individuals and community groups can *potentially* take to address climate change.

As described in Appendix #4: "PRUB-Logic – Enabling, compelling and inspiring actions" (Uses), actions by individuals and community groups need to be not only *enabled* but also either *compelled* or *inspired*.

Successful Projects produce Results that are both necessary and sufficient to *enable* Uses. But just because a Use is enabled does not mean it will happen.

So Uses, as well as being *enabled* by necessary and sufficient sets of Results also need to be either *compelled* (by legislation) or *inspired* (by the Benefits that users will gain from their Uses).

This PR SubStrategy identifies Uses that *potentially* could happen but does not, in this first draft form, identify if:

1. The necessary and sufficient Results exist
2. Legislation exists to compel the Uses
3. If the Benefits to the users from their Uses are sufficiently inspiring to motivate the Uses

The following scenarios are based on information received so far from scientists, local authorities, residents, farmers, Mana Whenua and other stakeholders. These scenarios are unlikely to be totally accurate but may be good indications of what is probable. They are provided here as a baseline for further discussions, not as finalised scenarios. These PCA actions are in addition to community-level actions identified in the earlier SubStrategies.

A key message relating to promoting PCAs to Timaru District stakeholders is to "double the good and halve the bad". It is more important that people actually start taking PCAs *of any sort, even small actions*, rather than waiting to be empowered or motivated to take more substantial actions.

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Likely Timaru District Personal Climate Actions scenarios in the next few decades if no additional climate-friendly actions are taken

1. Greenhouse gas emissions continue to rise, resulting in steadily and inevitably worsening impacts of climate change (primarily more extreme weather, coastal inundation and erosion and an unsustainable flood of climate refugees)
2. Extensive personal losses due to the above impacts of climate change
3. Continuing increases in food costs as 95% of Timaru District's food continues to come in from commercial suppliers outside the District from areas that themselves will be adversely impacted by climate change
4. Increased traffic congestion as people continue existing trends to own more and bigger vehicles (potentially off-set by likely fuel price increases and decreased availability)

Possible Timaru District Personal Climate Actions scenarios in the next few decades if we personally take action on climate change (to be developed/modified by and with our affected communities)

1. 2123 stakeholders look back 100 years and appreciate their good ancestors' actions
2. Stakeholders take many personal actions to address climate change with many of the actions described in a Personal Climate Actions campaign designed to guide people to take actions that are already enabled and to help people appreciate and be inspired by the Benefits they and others will gain through taking those actions.

PCA Recommendations

The main recommended actions distilled from the Personal Climate Actions SubStrategy are:

- **\*\*\*Project to identify Personal Climate Actions that are already enabled/compelled/inspired:** Given that many stakeholders are reluctant to take significant climate-friendly actions and that Personal Climate Actions need to be *enabled plus either compelled by legislation or inspired by Benefits*, this Project will identify those Personal Climate Actions that *are already* enabled and which are *already* compelled or which *already* appear highly likely to generate Benefits for stakeholders. The Project will also identify Personal Climate Actions that could easily become able to meet these criteria. This Project will therefore determine which of the Personal Climate Actions in the following SubStrategy are likely, or unlikely, to actually happen, and why.
- **\*\*\* Campaign to promote Personal Climate Actions:** Leading stakeholders develop and run a campaign to encourage stakeholders to take Personal Climate Actions that are climate-friendly, based on the key message of 'Double the Good, Halve the Bad'.

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Information Projects-Results

Information Projects	Information Results
<u>Independent reports</u> Further consolidate existing independent reports on <i>potential</i> Personal Climate Actions on climate change	An evolving PCA Independent Reports Library of PCAs that can <i>potentially</i> be taken
<u>Validated Personal Climate Actions:</u> 'Validated Personal Climate Actions' are those which are fully enabled and either compelled or sufficiently inspired by Benefits. This Project will continually assess <i>potential</i> PCAs to determine if they meet these criteria and should therefore be promoted	An evolving summary of <i>Validated</i> Personal Climate Actions ready for promotion to stakeholders
<u>Willingness to act</u> Understand and document the full spectrum of desired stakeholders' Uses and Benefits for 2050, 2100 and 2123 and what stakeholders are genuinely prepared to do if enabled to take PA actions. This includes determining people's current understanding of issues and then improving awareness and motivation to take actions.	A 'PCA Uses and Benefits Report' which defines Timaru District's stakeholders' full spectrum of desired Uses and Benefits in relation to PCA including their willingness to genuinely take PCA actions, their current levels of understanding of PCA options and what further information they need to become sufficiently informed, enabled and compelled/inspired to take PCA actions
<u>Stakeholders' questions:</u> Identify and answer stakeholders' questions, initially <i>finding rough answers quickly rather than detailed answers slowly</i> . Many of these questions will be addressed by the above two Projects. Some initial stakeholder questions include: <ul style="list-style-type: none"> <li>• What are the <i>likely</i> elements of the government's Climate Change Adaptation Plan especially relating to costs (given that the Adaptation Plan probably will not be finalised till late 2024)?</li> <li>• Which stakeholder actions will make the biggest climate change impacts in the Timaru District?</li> <li>• Where can I find a summary and guidance on <i>Validated</i> PCAs?</li> </ul>	A list of affected stakeholders' PCA questions plus rough, quickly obtained answers plus an indication of those questions where more detail is required. Where possible, sufficiently detailed information obtained to guide implementation decisions by all stakeholders.
Stakeholders prepare compelling business cases for promoting, better enabling and potentially compelling PCAs	Compelling business cases for promoting, better enabling and potentially compelling PCAs

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#### Legislation Projects-Results

<b>Legislation Projects</b>	<b>Legislation Results</b>
<u>Assess legality of solutions:</u> Assess the Validated PAs to identify and document which PCAs are already permitted, which PCAs could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation e.g. to include compulsion to act.	A 'PCAs Legislation report' on which solutions are already permitted, which solutions could be reasonably modified to become permitted or likely to be approved as discretionary solutions and which solutions require modifications to legislation.
<u>Legislatively enable solutions:</u> Wherever feasible, redraft legislation to permit and/or compel the desired PCAs.	Legislation is permissive and/or compels desired PCA solutions and where legislation is prohibitive, that legislation is backed by sound logic as to why prohibitions remain

#### Resourcing Projects-Results

<b>Resourcing Projects</b>	<b>Resourcing Results</b>
<u>Resourcing Projects:</u> Submit PCA business cases to agencies with funding and resources and, where realistic, secure sufficient resourcing to implement Projects to enable and compel or inspire PCAs	Resources available to implement <i>Validated</i> PCA options

#### Dissemination Projects-Results

<b>Dissemination Projects</b>	<b>Dissemination Results</b>
<u>Who needs to know?</u> Determine how, and to whom, resources must be disseminated to enable effective implementation of desired PCA options	A clear plan of how, and to whom, necessary resources will be disseminated to enable the implementation of PCA options
<u>Disseminate resources:</u> Disseminate resources to relevant stakeholders who will undertake asset-creating PCA Projects and/or Use the assets	Stakeholders have the resources they need to implement desired PCA Projects and Uses

#### Capital Works Projects-Results

<b>Capital Works Projects</b>	<b>Capital Works Results</b>
<u>Create PCA-enabling Results</u> Projects that will produce Results that are both necessary and sufficient to enable PCA Uses and Benefits (and in some instances to be 'Adopted' by other PCA-enabling Projects)	Results are in place that are both necessary and sufficient to enable PCAs
<u>Create PCA-compelling Results:</u> Projects that will develop and implement legislation that will compel PCAs	Legislation is in place that compels PCAs

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The potential PCA Projects and Uses below (1<sup>st</sup> column) have been loosely paired with likely Benefits (2<sup>nd</sup> column) because the proposed PAs are yet to be fully defined and assessed and so contain a mix of Projects and Uses.

<u>Potential PCA Projects and Uses as proposed by stakeholders but not yet assessed:</u>	<u>Potential direct and indirect Benefits</u>
<ol style="list-style-type: none"> <li>1. Public competitions e.g. youth competitions to identify new PCAs</li> <li>2. Promote feel-good stories on PCAs</li> <li>3. Distil potential PCAs from evolving sources such as the website 'It's Time Canterbury' and elsewhere</li> <li>4. Capture and store rainwater for gardens (untreated) or as potable water (treated)</li> <li>5. Eliminate rainwater ingress into waste water system</li> <li>6. Use low volume toilet flush</li> <li>7. Take shorter showers with low-flow shower heads</li> <li>8. Reduce daily travel especially single occupancy travel e.g. by working from home, visiting the supermarket half as often</li> <li>9. Reduce travel speeds</li> <li>10. Have holidays closer to home</li> <li>11. Switch to low emission vehicles especially plug-in eVs</li> <li>12. Walk, bus or cycle, e-cycle or scooter for short trips</li> <li>13. Install decentralised power system (and ideally batteries) e.g. solar, wind, micro-hydro</li> <li>14. Grow food locally such as at home or in community gardens</li> <li>15. Reduce food waste by buying carefully and preserving (drying, bottling) surpluses plus composting</li> <li>16. Increase vegetable protein content of meals instead of animal protein</li> <li>17. Buy foods and other goods that have the lowest possible carbon footprint and let retailers know so as to encourage them to stock low-emission products</li> <li>18. Build homes in safe zones</li> <li>19. Install energy efficient devices and replace old inefficient ones</li> <li>20. Design and build new homes so they make maximum use of passive energy and airflow</li> <li>21. Retrofit homes with north-facing conservatories, deciduous shade-trees on north and evergreens on south sides</li> </ol>	<ol style="list-style-type: none"> <li>1 &amp; 3. An as-yet-not-defined set of PCA-enabling Results depending on which Projects can be compellingly demonstrated to be worthwhile</li> <li>2. Stakeholders better informed and potentially inspired to take action</li> <li>4. Reduced demand on municipal water, water available if municipal system fails</li> <li>5. Lower water treatment volumes and costs</li> <li>6. Lower water demand</li> <li>7. Lower water demand</li> <li>8. Fewer GHG emissions</li> <li>9. Fewer GHG emissions</li> <li>10. Fewer GHG emissions</li> <li>11. Fewer GHG emissions</li> <li>12. Better health, fewer GHG emissions</li> <li>13. Fewer GHG emissions, resilient power in the event of centralised system failures</li> <li>14. Better health, tastier and fresher food, lower GHG emissions</li> <li>15. Less waste and lower GHG emissions, more food resilience when commercial supplies are compromised</li> <li>16. Lower GHG emissions (but potentially higher phosphate usage)</li> <li>17. Lower GHG emissions plus retailers motivated to stock lower GHG emission products for other people to also buy</li> <li>18. Resilient homes</li> <li>19. Lower energy demand and GHG emissions</li> <li>20. Lower energy demands and GHG emissions, healthier homes and people</li> <li>21. Lower energy demands and GHG emissions, healthier homes and people</li> </ol>

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22. Plant low-flammability gardens close to houses and on slopes below houses	22. Lower risk of homes burning in the event of wildfires
23. Exclude potentially disease-carrying insects (mosquitos) from ponds and other water bodies	23. Lower risk of insect-transmitted diseases in a warming planet

For further information and/or discussions on this draft Personal Climate Actions SubStrategy please contact:

Dr Phil Driver, [phildriver@openstrategies.com](mailto:phildriver@openstrategies.com), 021 0236 5861

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SubStrategy #6: Commercial Food Resilience SubStrategy

This SubStrategy #6 will be developed after a Commercial Food Resilience public workshop on the 5<sup>th</sup> July 2023.

Bibliography

The Canterbury Climate Change Risk Assessment by Tonkin and Taylor

Timaru District Coastal Hazard Assessment 2020, NIWA

Milford Huts Natural Hazards Overview

Catalogue of Coastal Hazard Adaptation Options, ChCh City Council

Ngai Tahu Climate Change Strategy

New Zealand Local Government Leaders' Climate Change Declaration 2017

Te Tiriti

The Resource Management Act 1991

The Local Government Act 2002

The Civil Defence and Emergency Management Act 2002,

The International Panel on Climate Change AP6 series of reports 2022/23

Timaru District stakeholders' perspectives

"How to talk about climate change in a way that makes a difference" Rebecca Huntly

New Zealand's draft National Adaptation Plan

Professor Anita Wreford, Leader, Deep South Challenge, Lincoln University

3 Fact Sheets from Environment Canterbury: Coastal Erosion; Coastal Flooding Due to Storms; Storm Surge

The Canterbury Water Management Strategy



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## Appendices

### Appendix 1: Statements from Various Sources Supporting the Timaru District Climate Change High Level Strategy

This appendix contains extracts from key documents that informed this high level TDCCS. These extracts informed the TDCCS but are not part of the TDCCS. These extracts have been provided rather than just links to the reports so as to make it easier for the reader to see which key statements have informed the TDCCS.

#### *Draft National Adaptation Plan- extracts*

##### **Building a climate-resilient Aotearoa New Zealand**

*The climate has warmed by 1.1°C in the past 100 years – we are already seeing the devastating effects. We can expect to continue to see rising sea levels, more extreme weather events, and increased risk of wildfire and drought. We can meet the challenges of a changing climate – but there is no time to waste. We need to take action now. That is the purpose of this national adaptation plan.*

##### **Long-term adaptation goals**

- *Reduce vulnerability*
- *Enhance our ability to adapt*
- *Strengthen resilience.*

##### **National climate change risk assessments**

- *Identify the climate-related risks we need to prepare for.*

##### **First national adaptation plan (2022-28)**

- *Better risk-informed decisions*
- *Climate-resilient development in the right location*
- *Adaptation options including managed retreat*
- *Embed climate resilience across Government.*

##### **Adaptation actions**

- *Strategies, policies and proposals to help us understand and respond to climate change risks.*

##### **Adaptation**

*Adaptation is a continuous process of assessing and managing risk, evaluating the effectiveness of actions taken and adjusting those actions as needed. By adapting to the unavoidable effects of climate change, we become more resilient to those risks.*

*Climate change is exacerbating the risk of existing natural hazards – including flooding and drought – and creating new risks such as sea-level rise. We can build on our past experience with natural hazards to prepare for increased risk in the future.*

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*Together, we can reduce our vulnerability to climate risk, enhance our ability to adapt and strengthen our resilience to a changing climate.*

*To support councils, communities, businesses and individuals to consider and understand the adaptation options available in their area, the Government will:*

- *pass legislation to support managed retreat of assets from at-risk areas*
- *review the future for local government to ensure councils are equipped for agile, sustainable and anticipatory decision-making*
- *publish the programme of work on how Aotearoa meets the costs of climate change and invests in resilience*
- *ensure kaitiaki have access to information and advice to help them understand threats to, reduce impacts on, and adapt taonga/cultural assets.*

*The Government will embed climate resilience across all its strategies and policies.*

***We are all affected by climate change and have a role in building resilience***

*Climate change will affect all of us in different ways. We all need to be prepared and we all have a role to play in building a climate-resilient Aotearoa.*

- ***Central government*** has a leadership role to play, and will establish policy and institutional settings that support effective adaptation.
- ***Local government*** is on the front line in managing climate effects and risks. Councils have functions and duties in relation to natural hazards, civil defence and emergency management, and improving community resilience.
- ***Māori*** have a unique role to play – as Te Tiriti o Waitangi partners, tangata whenua, and kaitiaki of their ancestral and cultural landscape.
- ***Communities*** and individuals need to be prepared to manage the impacts climate change will have on daily life and the risks to private assets.
- ***The private sector*** will need to invest in reducing risks to businesses and assets. Businesses can take advantage of new economic opportunities such as access to new technologies and markets.

***Our adaptation journey must be equitable***

*No two communities will experience climate change in the same way. Communities that are less able to adapt and disproportionately affected by climate change – including Māori, Pacific people and ethnic communities, low-income groups, disabled and older people, women, children and youth, and rural communities – are considered throughout this plan. This includes actions on infrastructure, housing and urban development, the reform of the institutional arrangements for water services, and development of legislation on managed retreat.*

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Local Government Leaders' Climate Change Declaration- extracts

### **Introduction**

*... We ask that the New Zealand Government make it a priority to develop and implement an ambitious transition plan for a low carbon and resilient New Zealand. We stress the benefits of early action to moderate the costs of adaptation to our communities. We are all too aware of challenges we face shoring up infrastructure and managing insurance costs. These are serious financial considerations for councils and their communities....*

*... For our part we commit to:*

- 1. Develop and implement ambitious action plans that reduce greenhouse gas emissions and support resilience within our own councils and for our local communities. These plans will:
  - a. promote walking, cycling, public transport and other low carbon transport options;*
  - b. work to improve the resource efficiency and health of homes, businesses and infrastructure in our district; and*
  - c. support the use of renewable energy and uptake of electric vehicles.**
- 2. Work with our communities to understand, prepare for and respond to the physical impacts of climate change.*
- 3. Work with central government to deliver on national emission reduction targets and support resilience in our communities....*

Timaru District stakeholders' perspectives on addressing climate change

Timaru District stakeholders have so far contributed over 50 pages of ideas on the values, principles and potential actions<sup>4</sup> that could be taken to addressing climate change in the Timaru district. These perspectives have been collected through interviews with leading stakeholders across all sectors, and through public workshops

The information, as and when it is collected and collated, can be accessed through the Timaru District Council website and informs this TDCCS high level strategy which focuses on Principles.

<https://www.timaru.govt.nz/services/environment/climate-change>

The science of climate change

The AP6 reports (insert link) from the International Panel on Climate Change state that climate change is unequivocally caused by humans and unless we hugely reduce our greenhouse gas emissions will cause major problems throughout the world. The science is robust and underpins the values and principles captured in this high-level TDCC strategy

*"This is urgent!" Anita says. "Everything we value is at stake if we do not reduce our emissions! But regardless of the level of global emissions reductions we achieve, we will experience some changes in climate. We need to start planning now, across all sectors, and all levels, and do things differently, to minimise the disruption this will have. And maybe in the process we can even make New Zealand a better place to live."*

Professor Anita Wreford, Leader, Deep South Challenge, Lincoln University

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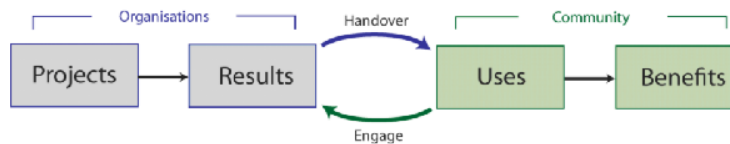
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Appendix 2: The Logical Structure for each SubStrategy in the Timaru District Climate Change Strategy

In order that the TDCCS strategies be as widely understood as possible, they have been structured in the format of ‘SubStrategies’ based on ‘PRUB-Logic’, a model developed by OpenStrategies Ltd (Insert reference).

*PRUB-Logic Represents Reality* as described in the following the generalised sequence:

*Projects create Results that enable Uses to create Benefits.*



This sequence is PRUB-Logic. PRUB-Logic represents:

*The smallest amount of strategic information  
that has the highest value  
to the most stakeholders*

Strategies based on PRUB-Logic generally conform to the PRUB-Logic Master Strategy as shown in Figure 1. The example shown in this figure is a high level *Aspirational SubStrategy* relating to water management in a river catchment.

The Master SubStrategy identifies 5 key Projects on the subjects of:

1. Information – such as data, strategies etc
2. Regulations and legislation – both existing and desired
3. Resources – money, physical resources, information
4. Dissemination – getting the resources to whoever is going to use them
5. Capital works – creating assets

The Master Strategy identifies that Projects 1-3 create ‘Adopted Orphan Results’ i.e. Results that are ‘Adopted’ by other Projects rather than Used by end-users.

Result #4 is both Useable by end-users and Adoptable by the asset creators in Project #5.

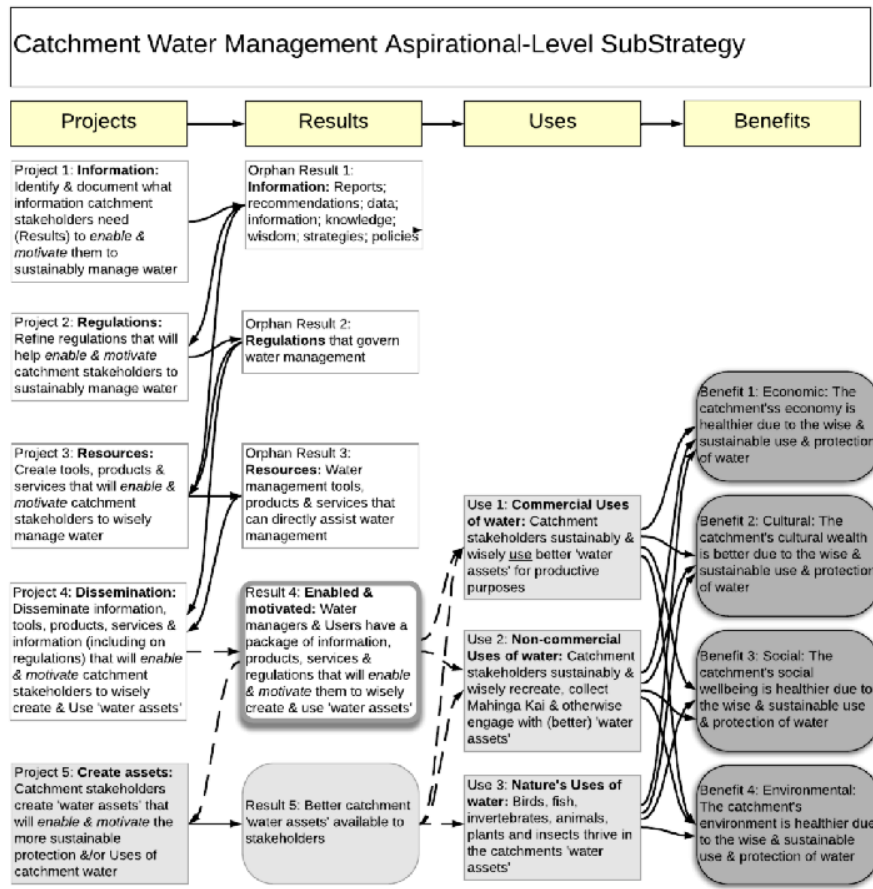
Results #4 and 5 are both Used by commercial, non-commercial and environmental users to create 4 categories of Benefits:

1. Economic
2. Environmental
3. Social
4. Cultural

Each PRUB-Logic-box in a SubStrategy is usually accompanied by an explanatory narrative which expands on the limited information in each box. In this sense, the SubStrategies are like contents-pages for the more detailed information contained in the narratives.

A hierarchy of related SubStrategies is known as an OpenStrategy.

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Appendix 3: PRUB-Logic: Enabling, compelling and inspiring actions

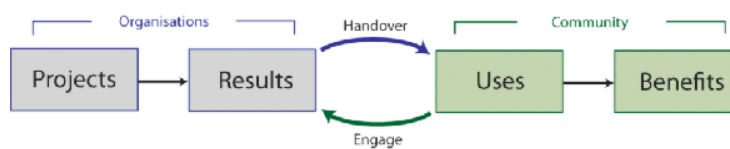
**PRUB-Logic Paper #39**

March 2023

This paper uses PRUB-Logic to identify the roles of organisations, governments, community groups and individuals in enabling, compelling and inspiring actions, with a simple worked example relating to climate change mitigation actions.

PRUB-Logic represents physical reality as shown in the generalised sequence:

*Projects create Results that enable Uses to create Benefits.*



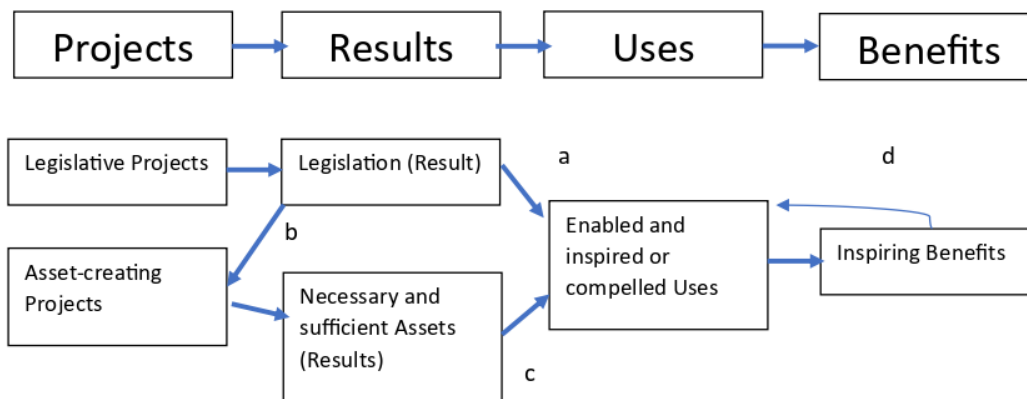
This sequence is PRUB-Logic.

In more detail:

- Projects *create* Results (assets/outputs).
  - In large scale public strategies, Projects are usually run by government agencies, businesses and community groups but sometimes by individuals
- Results *enable* (and sometimes *compel*) Uses
  - People and organisations (and nature) Use the Results provided the Results are both necessary and sufficient to *enable easy* Uses
- Uses *create* Benefits (outcomes)
- *Anticipated or previously experienced* Benefits *inspire* Uses

The following diagram explains this.

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- a. Legislation ***compels or permits*** Uses
- b. Legislation ***compels or permits*** asset-creating Projects
- c. ***Necessary and sufficient*** Results (assets) ***enable*** Uses
- d. ***Anticipated or previously experienced*** Benefits ***inspire*** Uses

Let us take an oversimplified example of fossil fuels Uses for transport.

Two Uses could be:

1. Freight companies are transporting food to supermarkets by truck
2. Individuals are driving to and from the supermarkets to buy food

How might it be possible to reduce these Uses of fossil fuels?

1. Growing food closer to the supermarkets would ***enable*** trucks to Use less fuel to deliver food to the supermarkets
2. Legislation requiring freight companies to use low emissions trucks would ***compel*** lower truck emissions
3. Having more smaller supermarkets closer to where people live would ***enable*** consumers to reduce their travel for food buying
4. By having shorter distances to travel, consumers would be ***inspired*** by having spent less on fuel and also ***inspired*** by having more time (that was not spent on travel)

So for Uses to actually happen and create the desired Benefits, every Use must be ***enabled*** (and ideally be easy) by Results that are both necessary and sufficient and either ***compelled*** by legislation (a Result) or ***inspired*** by the Benefits to the users created by the Uses.

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#### Appendix 4: Key Definitions

##### The Precautionary Principle

The precautionary principle is a broad epistemological, philosophical and legal approach to innovations with potential for causing harm when extensive scientific knowledge on the matter is lacking. It emphasizes caution, pausing and review before leaping into new innovations that may prove disastrous.

The principle is often used by policy makers in situations where there is the possibility of harm from making a certain decision (e.g. taking a particular course of action) and conclusive evidence is not yet available. For example, a government may decide to limit or restrict the widespread release of a medicine or new technology until it has been thoroughly tested. The principle acknowledges that while the progress of science and technology has often brought great benefit to humanity, it has also contributed to the creation of new threats and risks. It implies that there is a social responsibility to protect the public from exposure to such harm, when scientific investigation has found a plausible risk. These protections should be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result.

The principle has become an underlying rationale for a large and increasing number of international treaties and declarations in the fields of sustainable development, environmental protection, health, trade, and food safety, although at times it has attracted debate over how to accurately define it and apply it to complex scenarios with multiple risks. In some legal systems, as in law of the European Union, the application of the precautionary principle has been made a statutory requirement in some areas of law

[https://en.wikipedia.org/wiki/Precautionary\\_principle](https://en.wikipedia.org/wiki/Precautionary_principle)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446778/#:~:text=The%20precautionary%20principle%20asserts%20that,resolved%20in%20favor%20of%20prevention.>

##### Dynamic Adaptive Planning DAP

DAP is an approach for designing a plan that explicitly includes provisions for adaptation as conditions change and knowledge is gained. The resulting plan combines actions to be taken right away with those that make important commitments to shape the future and those that preserve needed flexibility for the future. The approach includes the specification of a monitoring system, together with the specification of actions to be taken when specific trigger values are reached.

[https://link.springer.com/chapter/10.1007/978-3-030-05252-2\\_3](https://link.springer.com/chapter/10.1007/978-3-030-05252-2_3)



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#### Appendix 5: South Canterbury Climate Trust initial concept

The Timaru District Climate Change Strategy recommends the establishment of a South Canterbury Climate Trust or similar entity to continue to develop and implement the TDCCS, ideally expanded to become a South Canterbury Climate Change Strategy.

##### Key points

1. The SCCT must be strategic and action focused, being crystal clear on how evolving information will be applied to make a real difference (i.e. not just a talk-fest)
2. The SCCT must necessarily start with where 'everyone' is currently at in terms of their willingness to take action on climate change, focusing on realistic actions that will actually be taken, not on ideals that won't happen.
3. The SCCT will be guided by, and will apply, the Principles of the TDCCS and its evolving SubStrategies.
4. The SCCT itself will take few, physical climate-change actions as most actions will necessarily take place out in communities and by various government bodies and agencies.
5. Membership of the SCCT
  - a. Professional subject-matter experts
  - b. Action-focused representatives of key stakeholders
    - i. local and central government and their agencies
    - ii. Mana Whenua
    - iii. industry
    - iv. health and welfare agencies
    - v. community groups
    - vi. citizens
  - c. Facilitator(s) who need to be highly informed of the science, engineering and sociological impacts of climate change plus experienced at distilling worthwhile strategic actions (i.e. not just 'nice to have fiddling at the margins')
6. *Rough* annual budget for the SCCT
  - a. Lead SCCT facilitator/manager \$100,000
  - b. Support team (admin, topic-specific facilitators) \$150,000
  - c. SCCT members, essentially an empowered version of the TDCCS Advisory Group (primarily monthly meetings x 11 workshops x 20 members with non-public sector members being remunerated at \$5-800/workshop = \$80,000)
  - d. Public, community and sector workshops (15 workshops on evolving topics + write-up at \$10k/workshop = \$150,000)
  - e. Commissioned reports (\$200,000)
  - f. Contingencies
  - g. Assume \$700,000 - \$1m

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**8 Consideration of Urgent Business Items**

**9 Consideration of Minor Nature Matters**