

## **CLIMATE CHANGE SIGNIFICANT FORECASTING ASSUMPTIONS - 9 YEAR PLAN 2025-34**

Department: Sustainability Group and Climate and City Growth

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### **EXECUTIVE SUMMARY**

- 1 The purpose of this report is to set out the intended approach to integrating climate change considerations into the 9 year plan 2025-34, and to seek Council approval of the climate change aspects of the significant forecasting assumptions.
- 2 This report also provides information about the growing expectations of regulatory bodies for councils to consider and address climate change, as well as an overview of national and local emissions context and commitments, and climate projections.

### **RECOMMENDATIONS**

That the Council:

- a) **Notes** the intended approach to integrating climate change considerations into the 9 year plan
- b) **Approves**, for the purposes of developing the 9 year plan 2025-34, and consulting with the community, the climate-related significant forecasting assumptions at Attachment A
- c) **Delegates** authority to the CEO to make any minor amendments to the climate-related significant forecasting assumptions
- d) **Notes** the climate-related significant forecasting assumptions may need updating following upcoming Council and Government decisions.

### **BACKGROUND**

#### **Climate change and Long Term Plans**

- 3 The Local Government Act 2002 (LGA) requires that all local authorities develop a Long Term Plan (LTP). Schedule 10 of the LGA specifies the minimum information and content; this includes significant forecasting assumptions (SFAs), which include growth and economic assumptions along with climate change projections.
- 4 Climate-related considerations are a growing focus area for auditors assessing local government Long Term Plans (LTP). In recent years, the Office of the Auditor-General (OAG) has stressed the need for councils to address climate change risk. The OAG has noted that

councils have an important role in understanding, planning for, and responding to the effects of climate change given their roles in environmental planning and regulation, transport planning, and responding to natural hazards and extreme weather events. For the 2023/24 financial year Audit New Zealand had a focus on climate change targets and reporting. A recent OAG report reviewed four Councils' climate work and set out five recommendations for Councils.

- 5 A key purpose of local government under the LGA is to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. Climate change mitigation (reducing emissions) and adaptation (preparing for the impacts of climate change) reduces long term risks and costs for council and the community, promotes future wellbeing, and responds to community expectations of climate action.
- 6 A report by Deloitte estimates that inadequate climate action could cost the New Zealand economy \$4.4 billion by 2050, with losses becoming exponentially worse after that. On the other hand, decisive climate action could deliver \$64 billion to New Zealand's economy by 2050.
- 7 For the Dunedin City Council (DCC), building emissions reduction and climate adaptation considerations into decision-making also responds to Council's strategic direction and the Zero Carbon Policy 2022.

### **Best practice guidance relating to climate change issued prior to 2021-31 LTPs**

- 8 Having found most councils' 2018-28 LTPs inadequately addressed climate change, the OAG and local government membership bodies published extensive advice on their expectations for 2021-31 LTPs. Climate change assumptions and disclosures were a focus for OAG auditors when auditing the 2021-31 LTPs, as was assessing the steps that councils were taking to reduce emissions and whether they were prioritising climate action.
- 9 The OAG recommended that councils should actively seek to understand the potential effects of climate change on its assets and activities, and that assumptions about climate change and its effects should be key building blocks for LTPs. All assumptions underpinning the LTPs should use the best available information, and climate change and related matters should be woven through the content of the LTP and the processes that support the LTP. Climate change assumptions should cover:
  - the expected effects of climate change for the city
  - the effects on council activities from the expected effects of climate change
  - the effects on different communities across the city
  - the effects of climate change on levels of service, council finances, and capital and operational work programmes over the period of the LTP.
- 10 The OAG articulated an expectation that councils that have declared climate emergencies should be demonstrating a tangible response of accelerating climate mitigation/adaptation activity, in the form of governance, management, and prioritisation of council activity and investment.

## OAG findings relating to climate change in 2021-31 LTPs

- 11 In matters arising from audits of the 2021-31 LTPs, the OAG noted a marked improvement in consideration of climate change.
- 12 They singled out two shifts as being particularly positive:
  - the increasing number of councils with dedicated climate action plans and resources, or those that are working on them, and
  - councils beginning to put climate-related performance targets and measures in their plans, and in some cases aligning reporting against these with recently developed national reporting standards.
- 13 They generally observed that the 17 councils that had declared climate emergencies (including the DCC), had included tangible actions or programmes relating to mitigating or adaptation to the effects of climate change in their LTPs, and noted that these were priority areas of council activity.
- 14 Specific references to the DCC's 2021-31 LTP included:
  - highlighting the DCC as an example of councils considering the equity or social justice aspects of climate change (in relation to building resilience and planning for long-term adaptation in South Dunedin) and
  - the DCC's 2030 emissions reduction target for Dunedin.

## 2024 OAG review of Councils' climate work

- 15 The OAG recently released a report reviewing climate work in four Councils. The report states that:

*"in many ways, councils are at the front line of a wider response to climate change. Councils are largely responsible for civil defence, regional and district land use, planning, and major community infrastructure. They are the owners of significant assets, some of which are at risk because of climate change. They also have a role in reducing greenhouse gas emissions.*

*Councils have obligations to keep their communities and assets safe from the impacts of a changing climate. They also have a responsibility to consult and keep their communities informed about the scenarios they are planning for and the steps they are taking to protect people and property."*

- 16 The OAG's recommendations are set out in the table below, along with the proposed DCC approach for progressing these through the Zero Carbon work programme and LTP. The recommendations also apply to climate change adaptation work at Councils. This will be considered in the context of citywide climate resilience planning.

OAG Recommendation for Councils	Proposed approach for 9 Year Plan and/or Zero Carbon work programme
Take opportunities to collaborate with and assist each other to understand the current	Collaboration is already a key part of the existing Zero Carbon work programme.

and likely impacts of a changing climate on their infrastructure and communities.	Existing collaborative relationships include: collaborating with the Otago Regional Council, participation in the Otago and nationwide climate officers groups, the Zero Carbon Alliance, and working alongside DCHL.
<p>Make clear in climate strategies:</p> <ul style="list-style-type: none"> <li>- what their climate-related objectives are,</li> <li>- how they intend to achieve those objectives,</li> <li>- how they will use their strategies to set priorities, and</li> <li>- how they will measure and report on progress in implementing their strategies.</li> </ul>	<p>Zero Carbon Policy, Zero Carbon Plan, and DCC Emissions Management and Reduction Plan (EMRP) set clear objectives.</p> <p>The implementation of the Zero Carbon Plan and EMRP will be finalised through 9 Year Plan investment decisions.</p> <p>A monitoring and reporting framework for implementation will then be developed.</p>
<p>Strengthen the use of performance measures that reflect climate-related strategic objectives and priorities.</p> <p>Report publicly on progress with their climate change strategies and work programmes, to support accountability and so communities are well-informed, engaged, and supportive.</p>	<p>The Zero Carbon team has provided advice relating to ways climate-related goals and targets can be reflected in levels of service and associated performance measures.</p> <p>A monitoring and reporting framework for implementation will be developed following finalisation of the Zero Carbon Implementation Plan (including EMRP actions).</p>
Clearly set out how climate-related activities will be governed and ensure that staff understand what information the relevant governance body needs to govern effectively.	<p>A Zero Carbon Advisory Panel has recently been established. Governance of the work programme sits with Council and the Strategy, Planning and Engagement Committee.</p> <p>For the 9 Year Plan, in line with the Zero Carbon Policy 2022, all proposed capital expenditure and all new proposed operating expenditure is being assessed for potential emissions impact.</p> <p>A Zero Carbon impact statement section will be added to Council report templates, to provide Councillors with information about the emissions impact of decisions. Guidance for staff has also been prepared.</p>

**OAG direction relating to the 9 year plan, and signalled areas of focus**

- 17 With climate-related reporting increasing in prominence, the OAG is strengthening assurance over climate-related reporting, decision making and planning processes through their annual audits.
- 18 In addition to the recommendations set out above, the OAG has set out updated expectations in the OAG's standard annual reporting, and several guidance documents relating to climate change reporting and financial statements have been published. Audit New Zealand had a strong focus on climate change reporting for the 2023/24 Annual Report.
- 19 Specifically, the OAG expects that:
  - a) 2024-34 LTPs will improve further on climate related content and approaches.
  - b) statements about climate change targets and progress will be clear, transparent and avoid greenwashing.
  - c) climate change will be included in performance measures and financial reporting.
- 20 In matters arising from audits of 2021-31 LTPs, the OAG noted that as councils develop their next LTP, they could consider the opportunity to take a strong leadership role in climate action in their district or region.

**Emissions reduction targets and emissions profiles**

- 21 This section sets out national, local and organisational emissions reduction targets relevant to 9YP decision making, as well as the most recent information available on city and organisational emissions sources.

***National emissions reduction targets***

- 22 As a signatory of the Paris Agreement, New Zealand has committed to taking actions that limit global warming to 1.5°C and to meeting a 'net zero' emissions by 2050 target. Domestic emissions reduction targets are embedded in the Climate Change Response Act 2002:
  - a) Net zero emissions of all greenhouse gas (GHG) emissions other than biogenic methane by 2050.
  - b) 24% to 47% reduction in biogenic methane emissions below 2017 levels by 2050, including 10% reduction below 2017 levels by 2030."

***Dunedin emissions reduction targets and 2021/22 emissions***

- 23 In 2019, the DCC declared a climate emergency and adopted a 'Zero Carbon 2030' emissions reduction target for Dunedin. As with national commitments, the target is in two parts:
  - a) Net zero emissions of all GHG emissions other than biogenic methane by 2030.
  - b) 24% to 47% reduction below 2017 biogenic methane emissions by 2050, including 10% reduction below 2017 biogenic methane emissions by 2030.
- 24 Dunedin's gross emissions in 2021/22 totalled 1.542 million tCO<sub>2</sub>e. The main contributing sectors were Agriculture and Transport, followed by Stationary Energy, Waste and Industrial

Processes and Product Use (IPPU) (Figure 1). This was offset by the city's forests absorbing 0.493 million t CO<sub>2</sub>-e, reducing net emissions to 1.049 million tCO<sub>2</sub>e.

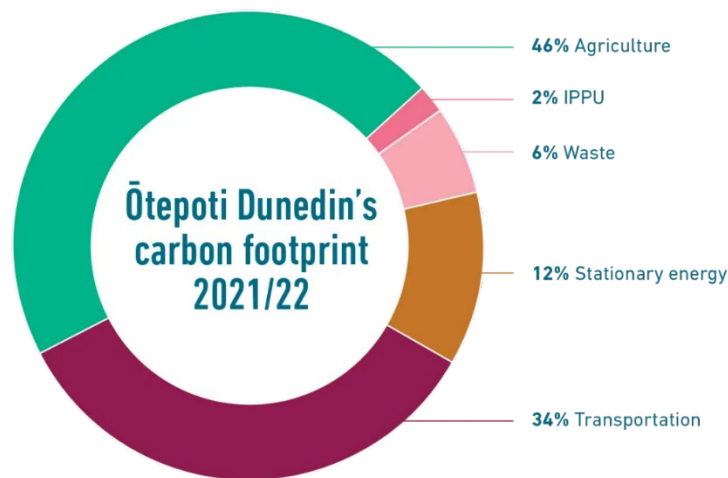


Figure 1: Dunedin City emissions 2021/22

- 25 There was some progress towards the target between 2018/19 and 2021/22. Total gross emissions in Dunedin decreased from 1,697,047 tCO<sub>2</sub>e to 1,542,500 tCO<sub>2</sub>e, a decrease of 9% (154,546 tCO<sub>2</sub>e). Each sector reduced its emissions between 2018/19 and 2021/22 (Figure 1).
- 26 Over this time, the population of the city increased by 2%, resulting in per capita gross emissions in Dunedin reducing by 11% between 2018/19 and 2021/22 (from 13.0 to 11.5 tCO<sub>2</sub>e per person per year), in line with the decrease in total gross emissions.
- 27 Trends in emissions will be set out in further detail in the draft City Snapshot, in a future Council report.
- 28 The city's emissions profile will be updated again in 2025 using 2024/25 data.

#### **DCC's emissions reduction targets and 2022/23 emissions**

- 29 The DCC's emissions reduction targets for its organisational footprint are set out in Table 1 below.

Target	2018/19 Baseline (tCO <sub>2</sub> e)	Target date
30% reduction in annual tCO <sub>2</sub> e emissions	84,216	2026/27
42% reduction in annual tCO <sub>2</sub> e emissions	84,216	2030/31

- 30 DCC's gross emissions for the 2022/23 period totalled 60,912 tCO<sub>2</sub>-e. Major emissions sources (Figure 2) were waste to Green Island Landfill (52%), closed landfills (13%), and wastewater treatment (12%). Relatively fewer emissions originated from major suppliers (9%), electricity use (4%) LPG use (4%), and chemical use (3%). Other minor emissions sources made up the final 3% of the footprint. DCC's 2023/24 emissions inventory is still subject to audit assurance. Council will be updated on the results once this process is complete.

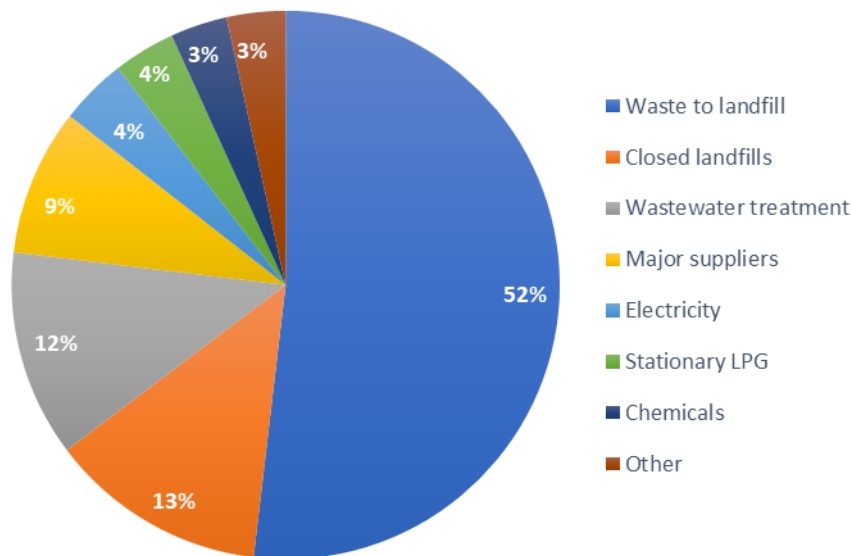


Figure 2: DCC emissions 2022/23

- 31 There has also been some progress towards DCC organisation emissions targets. As of 2022/23, DCC emissions had reduced by 27.67% compared to the 2018/19 baseline.

### Risk and adaptation frameworks, and projected climate change impacts

- 32 This section describes the national frameworks established to assess risk and adapt to climate change and sets out current understanding of projected national and local climate change impacts.

#### National climate change risk and adaptation frameworks

- 33 In August 2020, the Ministry for the Environment (MfE) published the first [National Climate Change Risk Assessment \(NCCRA\)](#), which acknowledged that the climate is changing and that further changes will result from increasing amounts of greenhouse gases in the atmosphere.
- 34 The NCCRA noted that in New Zealand, the effects of this change are already being experienced. Over the past century, temperatures have increased, glaciers have melted and sea levels have risen. Such changes will continue, and their impacts will increase. These future changes will have far-reaching consequences for people and the environment – in cities, towns and communities, across all levels of government, and from the coastline to lakes, rivers and forests.
- 35 New Zealand's 10 most significant climate change risks (across five domains) include:
- Natural environment: Risk to coastal ecosystems due to ongoing sea-level rise and extreme weather events; risk to indigenous ecosystems and species from enhanced spread, survival and establishment of invasive species.
  - Human: Risks to social cohesion and community wellbeing from displacement of individuals families and communities; risk of exacerbating existing inequalities and creating new ones.

- Economy: Risk of lost productivity, disaster relief expenditure and unfunded contingent liabilities; risks to financial system from instability due to extreme weather events and ongoing gradual changes.
  - Built environment: Risk to potable water supplies (availability and quality) and buildings due to changes in rainfall, temperature, drought, wildfire, extreme weather events and ongoing sea-level rise.
  - Governance: Risk of maladaptation due to decisions that do not account for uncertainty and change over long timeframes; risk that climate change impacts are exacerbated because current institutional arrangements are not fit for adaptation.
- 36 In August 2022, and in response to the NCCRA, MfE published the first [National Adaptation Plan \(NAP\)](#) 2022-28, which outlined a national structure and set of processes for adapting to the impacts of a changing climate in Aotearoa New Zealand.
- 37 The NAP noted that 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 risks 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.
- 38 The four key focus areas of the NAP 2022-28 include:
- Better risk-informed decisions
  - Climate-resilient development in the right location
  - Adaptation options including managed retreat
  - Embed climate resilience across government

### ***Projected climate change impacts***

- 39 The following projections for climate change impacts are derived from the NCCRA, NAP, [research undertaken by NIWA](#) on climate change projections for the Otago Region (commissioned by the Otago Regional Council in 2019), and the [Aotearoa New Zealand climate change projections guidance: Interpreting the latest IPCC WG1 report findings](#) (commissioned by MfE in 2022, updated in 2023).
- In the last 100 years, our climate has warmed by 1.1°C. Depending on global emissions, temperatures will likely increase by a further 1-1.3°C by mid-century and 1.6-3.1°C by end of century, with the greatest warming likely to be in the northeast of New Zealand.
  - In the last 60 years, sea levels have risen by 0.15 m (or around 2.44 mm per year). If global emissions remain high, sea levels will likely increase by a further 0.21 m by 2040 and 0.67 m by 2090.
  - Extreme weather events such as storms, heatwaves and heavy rainfall are likely to be more frequent and intense. Large increases in extreme rainfall are expected everywhere in the country. Annual rainfall in Otago is expected to increase slightly by mid-century (0-10%), while the increase spans 10-20% at the end of the century.



- The number of frost and snow days are projected to decrease.
- Drought is predicted to increase in frequency and severity, particularly along the eastern side of the Southern Alps. Wildfire risk is predicted to increase.

***Guidance on planning for, and adapting to, the impacts of climate change***

- 40 Further to requirements of the LGA in regard to LTP processes, and directions issued by the OAG in relation to climate change, both noted above, in July 2022 MfE issued [updated guidance](#) relating to coastal hazards and climate change (which builds on previous guidance from 2017).
- 41 When exercising their functions under the Resource Management Act 1991 (RMA) and giving effect to the provisions of the New Zealand Coastal Policy Statement (NZCPS), councils should use a framework of five “medium confidence” climate change scenarios.
- 42 These five scenarios use shared socio-economic pathways (SSPs) introduced by the IPCC (Intergovernmental Panel on Climate Change) Sixth Assessment Report (AR6) published in 2021-23. These span a wide range of plausible societal and climatic futures and replace the previous representative concentration pathways (RCPs) used in the 2017 guidance. The scenarios include:
- SSP1-2.6 Median (Sustainability) - Aspirational pathway with extremely low emissions
  - SSP2-4.5 Median (Middle of the road) - Most likely scenario, with emissions reductions consistent with historic social, economic and technological trends
  - SSP3-7.0 Median (Regional rivalry) - Resurgent nationalism over regional and global issues
  - SSP5-8.5 Median (Fossil fuel intensive development) – Ongoing emissions-intensive development
  - SSP5-8.5 H+ (Upper likely range) - Worst case scenario.
- 43 MfE’s advice recommends using the five updated “medium confidence” scenarios out to 2150 to undertake risk and vulnerability assessments and stress-test proposals, strategies, project designs, policies, rules, statutory coastal hazard overlays, and emerging spatial plans.
- 44 It is also recommended to include vertical land movement (VLM) rates to calculate relative sea-level rise (RSLR) locally, or if rates are low, average them regionally. Where local VLM rates are specifically monitored and more granular, these should be used instead.
- 45 To further stress test risk-sensitive or long-lived projects such as new subdivisions, long-lived infrastructure, or vulnerable cultural sites, “low confidence” SSP scenarios could be used (which extend beyond 2150 and model some more uncertain contributors to sea-level rise, such as instabilities of polar ice shelves).

## **DISCUSSION**

### **Approach to integrating climate change considerations in the 9 year plan**

- 46 To respond to OAG expectations and guidance, and Taituara guidance, the following steps are being taken to integrate climate change considerations in the 9YP.

9 year plan element	Proposed approach
City Snapshot	Draft Dunedin emissions and climate change sections included in City Snapshot for Council consideration at a future Council meeting.
Forecasting assumptions	Draft climate-related significant forecasting assumptions set out for Council consideration in this report.
Financial and infrastructure strategies, policy reviews	Climate change and Zero Carbon sections of the financial and infrastructure strategies will be updated to reflect South Dunedin Future and Zero Carbon work programme progress and relevant Council decisions made since adoption of the 2021-31 Long Term Plan, including: <ul style="list-style-type: none"> <li>- adoption of the South Dunedin Future work programme</li> <li>- adoption of the Zero Carbon Policy 2022</li> <li>- adoption of the DCC's Emissions Management and Reduction Plan 2023/24-2030/31</li> <li>- progress against key projects that were identified in the 2021-31 10YP as being important contributors to climate change response</li> <li>- adoption of the Zero Carbon Plan 2030</li> <li>- Council's decisions on investment options for Zero Carbon Plan implementation.</li> </ul>
Financial statements	These are prepared in line with accounting standards and legislative requirements. Relevant statements, risks, policies or other documents to be reviewed in line with the OAG's guidance on "Accounting for climate change."
Provision of information for decision-making	In line with the Zero Carbon Policy 2022, all proposed capital expenditure and all new proposed operating expenditure is being assessed for potential emissions impact. A Zero Carbon impact statement section will be added to Council report templates, to provide Councillors with information about the emissions impact of decisions. Guidance for staff has also been prepared.
Service and activity information and reporting	The Zero Carbon team has provided advice relating to ways climate-related goals and targets can be reflected in levels of service and associated performance measures.
Consultation document	Consideration will be given to how climate-related issues can be reflected in consultation documents, following relevant decisions of Council.

### Climate-related Significant Forecasting Assumptions

This section sets out the proposed approach to the climate-related SFAs for the 9 year plan 2025-34. **Significant Forecasting Assumptions**

47 Schedule 10 (17) of the LGA provides the following:

A long-term plan must clearly identify—

- (a) all the significant forecasting assumptions and risks underlying the financial estimates:
  - (b) without limiting the generality of paragraph (a), the following assumptions on which the financial estimates are based:
    - (i) the assumptions of the local authority concerning the life cycle of significant assets; and
    - (ii) the assumptions of the local authority concerning sources of funds for the future replacement of significant assets:
  - (c) in any case where significant forecasting assumptions involve a high level of uncertainty,
    - (i) the fact of that uncertainty; and
    - (ii) an estimate of the potential effects of that uncertainty on the financial estimates provided.
- 48 The strategic significant forecasting assumptions (SFA's) traditionally include the key assumptions around growth, climate change and economic projections.

***Best practice guidance for climate-related SFAs***

- 49 Best practice guidance directs that climate change assumptions must be realistic, evidence based, internally consistent with other assumptions and applied consistently across the organisation.
- 50 Climate change assumptions are likely to include the expected direct impact of climate change in the local area (e.g. sea-level rise, rainfall levels) and the impacts on communities from the expected effects of climate change (including broader impacts on the social, environmental, economic and cultural wellbeing of the local community), and how these might flow through to the local authority.

***Draft SFAs for the 9 Year Plan 2025-34***

- 51 Draft significant forecasting assumptions related to emissions reduction targets and climate change projections are at Attachment A, for Council approval. Growth assumptions and economic projections are presented in reports under separate cover.
- 52 The climate related SFAs have been updated since the previous LTP to reflect updated understanding and changes in our context:
- The City and DCC emissions reduction targets SFA has been updated since the last LTP to reflect work programme progress and additional DCC decisions relating to emissions reduction. In particular, since the last LTP, Council has adopted the Zero Carbon Plan (2023) and the Zero Carbon Policy (2022).
  - The Climate Change Projections SFA is based on updated national guidance from the Ministry for the Environment (MfE), supporting research from the National Institute for Water and Atmospheric Research (NIWA), and information derived from Victoria University of Wellington's NZ SeaRISE Programme. In the interests of simplicity, only two of the five scenarios are proposed to be included in the 9YP, SSP2-4.5 (Middle of the Road) and SSP5-8.5 (Fossil fuel intensive development).

***Uncertainty around draft SFAs***

- 53 The level of uncertainty associated with the assumptions are medium and high, due to the potential impact of Council decisions, and other entities' decisions and actions on long-term outcomes (such as central government), and upcoming data releases.

54 The assumptions will be reviewed and further advice provided, following:

- Finalisation of the government's second emissions reduction plan (due before the end of 2024)
- Council decisions on High / Medium Zero Carbon Investment packages
- Ministry for the Environment and NIWA release of data on climate change impacts.

## **OPTIONS**

### **Option One – The draft climate-related SFAs are approved. Recommended Option.**

55 Council approves the draft climate related SFAs for development of, and inclusion in, the draft 9 Year Plan 2025-34 (with or without amendment), noting that these will be reviewed, and further advice provided following decisions of Council and Government in late 2024.

#### *Advantages*

- The draft climate related SFAs will be used to further inform the development of the 9 year plan.
- Meets OAG guidelines for progressing climate actions as part of 9 year plan.

#### *Disadvantages*

- The climate related SFA may require revision, following additional information and decisions.

### **Option Two – The draft climate-related SFAs are not approved.**

56 Council does not approve the draft climate related SFAs and requires further work be undertaken to amend as necessary.

#### *Advantages*

- There are no identified advantages.

#### *Disadvantages*

- Further work would be required to amend the climate related SFAs, which would put further pressure on meeting time frames for the development of the 9 Year Plan 2025-34.

## **NEXT STEPS**

57 If approved, the draft climate-related SFAs will be included in, and used to support the development of the draft 9 Year Plan 2025-34.

58 As noted, the climate-related SFAs will be reviewed and updated following additional information and decisions. Any substantive changes will be presented to Council.

## Signatories

Author:	Florence Reynolds - Zero Carbon Senior Policy Analyst, Sustainability Jinty MacTavish - Principal Policy Advisor Sustainability Jonathan Rowe - Programme Manager, South Dunedin Future
Authoriser:	Scott MacLean - General Manager, Climate and City Growth

## Attachments

	Title	Page
A	Appendix A Climate-related SFAs for the 2025-34 9 Year Plan	

## SUMMARY OF CONSIDERATIONS

### ***Fit with purpose of Local Government***

This decision enables democratic local decision making and action by, and on behalf of communities, and promotes the social, economic, environmental and cultural wellbeing of the Dunedin communities, taking a sustainable development approach.

### ***Fit with strategic framework***

	Contributes	Detracts	Not applicable
Social Wellbeing Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic Development Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environment Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arts and Culture Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Waters Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spatial Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integrated Transport Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parks and Recreation Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other strategic projects/policies/plans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The 9 year plan contributes to all of the objectives and priorities of the strategic framework as it describes the Council's activities, the community outcomes, and provides a long term focus for decision making and coordination of the Council's resources, as well as a basis for community accountability.

### ***Māori Impact Statement***

The adoption of the Māori Strategic Framework signals Council's commitment to mana whenua and to its obligations under the Treaty of Waitangi. Mana whenua and Māori will be involved in pre-engagement and have an opportunity to engage with the 9 year plan consultation process through a series of planned hui.

### ***Sustainability***

As part of the 9 year plan, several pieces of work are underway to give effect to Council's commitment to sustainability, including the strategic refresh and the workplan set out in this paper.

### ***Zero Carbon***

This report sets out proposed Zero Carbon Significant Forecasting Assumptions for the 9 year plan, noting that these will be reviewed following finalisation of the government's second emissions reduction plan and decisions of Council relating to Zero Carbon packages.

This report also sets out the proposed approach to integrating Zero Carbon considerations into the 9 year plan.

### ***LTP/Annual Plan / Financial Strategy /Infrastructure Strategy***

This report provides an update on the development of the 9 year plan. The 9 year plan project includes specific workstreams that will review Council's financial and infrastructure strategies to ensure they are appropriate for the future.

### ***Financial considerations***

Financial considerations (including financial sustainability) will be key considerations in the development of the 9 year plan.

**SUMMARY OF CONSIDERATIONS*****Significance***

The 9 year plan will include community engagement and public consultation. Pre-engagement initiatives are being planned.

***Engagement – external***

The 9 year plan presents an opportunity for Council to engage fully with the community across a range of issues.

***Engagement - internal***

Staff from across council are involved in the development of the 9 year plan.

***Risks: Legal / Health and Safety etc.***

There are legal, reputational, financial and strategic risk if the 9 year plan is not well executed, or the public do not trust that the Council is showing good governance, prudent strategic and operational leadership.

***Conflict of Interest***

There are no known conflicts of interest.

***Community Boards***

Community Boards will be engaged and consulted with as part of the 9 year plan.

## Appendix A: Climate-related SFAs for the 2025-34 9 Year Plan

Assumption	Level of uncertainty	Reason for uncertainty	Effects of the uncertainty
<p><b>CLIMATE CHANGE</b> <b>City and DCC emissions reduction targets</b></p> <p>In 2019 the DCC declared a climate emergency and adopted a 'Zero Carbon 2030' city emissions reduction target for Dunedin, in two parts:</p> <ul style="list-style-type: none"> <li>- net zero emissions of all greenhouse gases other than biogenic methane by 2030</li> <li>- 24 to 47% reduction in biogenic methane emissions below 2017 levels by 2050, including a 10% reduction below 2017 levels by 2030.</li> </ul> <p>The Zero Carbon Plan adopted in 2023 sets out the changes needed for the city to achieve its targets, and the DCC's role in achieving these changes.</p> <p>The DCC also has a commitment to reduce emissions from its own operations, including a goal to reduce all its core organisational emissions by 42% by 2030/31 (from a 2018/19 baseline). An interim target of 30% reduction from baseline by 2026/27 is intended to ensure DCC is tracking well. The DCC's Emissions Management and Reduction Plan 2023/24 to 2030/31 sets out actions needed to achieve the 2030/31 organisational emissions reduction target.</p> <p>The Zero Carbon Policy adopted in 2022 mandates that the DCC's activities minimise emissions and contribute to achieving emissions reduction targets.</p>	<p>For Dunedin's emissions reduction target, high.</p> <p>For the DCC's organisational emissions reduction target, medium.</p>	<p>Achieving both city and DCC emissions reduction targets in part relies on central government funding and policy settings that support emissions reduction. Both are subject to change.</p> <p>Achieving city emissions reduction targets relies on the actions of not only the DCC and central government, but also a wide range of other stakeholders.</p> <p>Community support for rates funding of DCC actions required to reduce city</p>	<p>Potential impacts of organisational and city emissions reduction targets not being met include:</p> <ul style="list-style-type: none"> <li>• misalignment with the DCC's strategic commitments and Zero Carbon Policy</li> <li>• possible misalignment with national policy direction relating to emissions reduction</li> <li>• misalignment with community expectations around the DCC or city contribution to global efforts to combat climate change, leading to negative effects on political and organisational reputation</li> <li>• potential financial costs (for DCC and residents) due to continued reliance on fossil fuels and associated price volatility</li> <li>• potential financial costs (for DCC and residents) due to the need to address liabilities, or meet targets/legislative requirements for residual emissions</li> <li>• potential loss of anticipated wellbeing co-benefits associated with emissions reduction actions</li> </ul> <p>For DCC emissions targets, an additional potential impact is possible exclusion from Local Government Funding Authority opportunities for reduced costs of borrowing (enabled by organisational emissions reduction effort).</p>



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<p>It is assumed the DCC will meet its organisational targets, including through adherence to its Emissions Management and Reduction Plan and Zero Carbon Policy.</p> <p>It is assumed that emission reduction targets for Dunedin will be met through the actions of a wide range of stakeholders, including the DCC (including by implementing the Zero Carbon Plan and adhering to the Zero Carbon Policy).</p> <p>These assumptions will be reviewed, following relevant upcoming Council and Government decisions.</p>		emissions in line with targets has not yet been tested.	
<p><b>Climate change projections:</b></p> <p>The DCC projections are based on Shared Socioeconomic Pathways (SSPs) developed by the Intergovernmental Panel on Climate Change (IPCC) to describe five different socioeconomic scenarios and related greenhouse gas emissions.</p> <p>The SSPs used in DCC projections include SSP2-4.5 (intermediate emissions) and SSP5-8.5 (very high emissions). SSPs are scenarios of projected socioeconomic global changes up to 2100. They describe the alternative pathways of greenhouse gas emissions and are based on different assumptions about population, economic growth, energy consumption, land use, and emissions reductions over this century.</p>	<p>It is unequivocal that human influence has warmed the atmosphere, ocean and land<sup>4</sup>.</p> <p>Global surface temperature was 1.09°C higher in 2011–2020 than 1850–1900, with larger increases over land than over the ocean (high confidence)<sup>4</sup>.</p> <p>Global mean sea level has risen by 0.2m between</p>	<p>The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near term<sup>4</sup>.</p> <p>Climate change and associated impacts may occur at a faster or slower rate, depending on policy choices, emissions pathways, and changes to the</p>	<p>The potential impacts of greater than projected climate change, particularly sea level rise and extreme rain events are:</p> <ul style="list-style-type: none"> <li>• increase in adverse impacts, such as natural hazards like sea-level rise, flooding, and erosion.</li> <li>• a more rapid change in the environment and ecosystems</li> <li>• a requirement for the DCC to accelerate its adaptation plans to reduce the harm on communities</li> <li>• an increased cost of adaptation in the short to medium term</li> <li>• less time for engagement, and planning with the community</li> <li>• potential for widening wealth inequality and a reduction in social cohesion in affected communities.</li> </ul>

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<ul style="list-style-type: none"><li><b>SSP2-4.5:</b> The “middle of the road” scenario with intermediate emissions. The world follows a familiar path in which social, economic, and technological trends do not shift markedly from historical patterns. Global emissions stabilise and trend downwards from 2050, reaching net zero sometime after 2100. Global surface temperature is expected to rise by 2.7°C by 2100. This is the path we are on, if we follow current policy settings.</li><li><b>SSP5-8.5:</b> The ‘fossil-fuelled development’ scenario with very high emissions. Global emissions continue to increase rapidly through mid-parts of the century stabilising around 2100. Economic growth is high but based on energy-intensive lifestyles dependent on ongoing fossil fuel exploitation. Global surface temperature is expected to rise by 4.4°C by 2100. This is a worst-case scenario, and though considered unlikely, is relevant for long term planning.</li></ul>	<p>1901-2018, with the rate of rise accelerating, to 3.7mm/yr between 2006-18 (high confidence)<sup>4</sup>.</p> <p>Climate change will result in adverse impacts on cities, settlements and infrastructure (high to very high)<sup>4</sup>.</p>	atmosphere, ocean, cryosphere and biosphere <sup>4</sup> .			
<table><tr><td>Mean temperature change (SSP2-4.5 and SSP5-8.5, relative to 1995-2014 baseline)<sup>1</sup></td><td><p>SSP2-4.5: By 2050: +1°C (0.6-1.32 °C)</p><p>SSP2-4.5: By 2100: +1.6°C (1.03-2.26 °C)</p><p>SSP5-8.5: By 2050: +1.3°C (0.91-1.66 °C)</p></td></tr></table>	Mean temperature change (SSP2-4.5 and SSP5-8.5, relative to 1995-2014 baseline) <sup>1</sup>	<p>SSP2-4.5: By 2050: +1°C (0.6-1.32 °C)</p> <p>SSP2-4.5: By 2100: +1.6°C (1.03-2.26 °C)</p> <p>SSP5-8.5: By 2050: +1.3°C (0.91-1.66 °C)</p>			
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	SSP5-8.5: By 2100: +3.1°C (2.20-4.05 °C)					
Sea level Rise (SLR) <i>(metres above 1995-2014 baseline; excluding localised vertical land movement)<sup>2</sup></i>	SSP2-4.5: By 2050: +0.22m (0.16- 0.29m) SLR  SSP2-4.5: By 2100: +0.56m (0.43- 0.75m) SLR  SSP5-8.5: By 2050 +0.25m (0.20-0.32m) SLR  SSP5-8.5: By 2100 +0.81m (0.64-1.06m) SLR					
Average number of hot days per year [temperature >30c] <i>(relative to average present, 1 extreme hot day every 5 years) <sup>3</sup></i>	By 2040: On average, 0.5 to 0.6 extreme hot days every year  By 2090: On average, 0.8 to 1.8 extreme hot days every year					
Average number of frost days per year [temperature <0c] <i>(relative to average present 9.3 frost days per year)<sup>3</sup></i>	By 2040: On average, 7.5 to 7.4 frost days every year  By 2090: On average, 6.4 to 3.3 frost days per year					
Annual Rainfall volume <sup>3</sup>	By 2040: +2%					

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	By 2090: +5% to +13%			
Volume of rain during 1hr duration 1:100-year extreme rainfall event (mm of rain increases relative to present 32mm) <sup>3</sup>	By 2040: +3.2mm to +3.7mm in an hour period  By 2090: +5.2mm to +11.2mm in an hour period			
Snow Days <sup>3</sup>	Under all scenarios the number of snow days reduces everywhere in Otago.			
Waves and Storm Surges <sup>3</sup>	Under all scenarios storm surge peaks for the south Otago coast are estimated to increase over the century.			
<p>New data is expected from the Ministry for the Environment and NIWA by the end of 2024 which will be downscaled to a 5km grid and include Territorial Authority summaries. The assumptions above will be updated once this information becomes available.</p> <p><b>Sources:</b></p> <p>1.Bodeker, G., Cullen, N., Katurji, M., McDonald, A., Morgenstern, O., Noone, D., Renwick, J., Revell, L. and Tait, A. (2022). Aotearoa New Zealand climate change projections guidance: Interpreting the latest IPCC WG1</p>				

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<p>report findings. Prepared for the Ministry for the Environment, Report number CR 501, 51p. (<a href="#">link</a>)</p> <p>2. NZ SeaRise Projections (<a href="#">link</a>)</p> <p>3. NIWA 2019. <i>Otago Climate Change Projections for the Otago Region</i>. Wellington (<a href="#">link</a>)</p> <p>4. IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001 (<a href="#">link</a>)</p>			

