

Dunedin City Council

Emissions Management and Reduction Plan

2025/26 to 2029/30

Emissions Management and Reduction Plan		 DUNEDIN kaunihera CITY COUNCIL a-rohe o Ōtepoti	
Approved by:	Executive Leadership Team		
Sponsor:	Chief Executive Officer		
Department responsible:	Climate Change Group Huringa Āhuarangi		
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1. Purpose

This Greenhouse Gas Emissions Management and Reduction Plan (EMRP) sets out how the Dunedin City Council (DCC) intends to reduce its emissions over the period 2025/26 to 2029/30.

This updates the EMRP 2023/24-2030/31, adopted by DCC's Executive Leadership Team (ELT) in June 2024. The updates since 2024 reflect funding decisions made in the DCC's 9 Year Plan 2025-2034, as well as updates to some methodologies and emissions sources that have been integrated into the DCC's inventory, and updated targets.

Preparing and implementing an EMRP supports the DCC to reduce its emissions in line with targets and the DCC's Zero Carbon Policy.

This EMRP focuses on DCC's emissions generated by its operations. It is separate from (but related to) the Zero Carbon Plan, which maps out how Dunedin can progress towards city emissions reduction targets.

2. Introduction

Dunedin's Zero Carbon targets

In 2019, the Council declared a climate emergency and set two targets for Dunedin's emissions ('Dunedin's Zero Carbon targets' – Figure 1):

- **Net zero carbon by 2030 (excluding biogenic methane)**
Net zero carbon means that any greenhouse gases (GHG) emitted into the atmosphere in Dunedin (excluding biogenic methane) are balanced out by the amount of GHG sequestered from the atmosphere.
- **Reduce biogenic methane emissions**
Dunedin's biogenic methane reduction targets are the same as the central government targets:
 - 10% reduction from 2017 levels by 2030.
 - 24-47% reduction from 2017 levels by 2050.

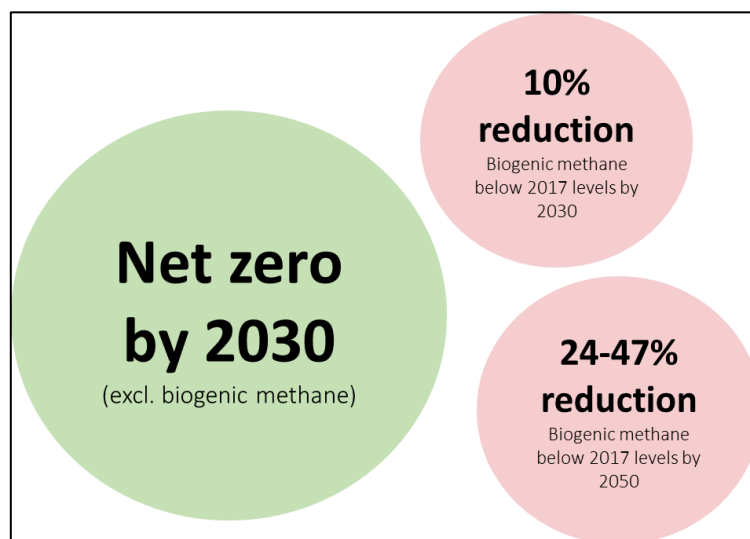


Figure 1: Dunedin's Zero Carbon targets

In 2023 the DCC adopted the Zero Carbon Plan, which sets out a pathway to achieve Dunedin's Zero Carbon targets. Since then, considerable changes in central government policy have significantly changed the context. Updated modelling suggests only the biogenic methane target remains achievable by 2030/31. Council will consider updates to the net zero element of the target in early 2026.

Reducing DCC's own emissions supports achievement of city targets

For example, as of 2021/22 emissions from city waste to landfill and wastewater treatment, which are responsible for more than two-thirds of the DCC's emissions, also constitute approximately 6.3% of Dunedin city's emissions. Addressing the DCC's emissions is therefore an important contribution to Dunedin's emissions reduction efforts. Demonstrating leadership in achieving organisational emissions reductions is also important for the DCC, so the organisation can encourage others' emissions reduction efforts with credibility.

DCC's emissions reduction journey so far

The Council's commitments to reducing organisational emissions are embedded in the DCC's strategic and policy framework.

Notable milestones include:

- 2012 – the DCC's first emissions inventory
- 2014 – annual DCC emissions inventories commence
- 2017 – adopting the DCC's Carbon Management Policy
- 2019 – establishing the Zero Carbon work programme to help Dunedin and the DCC achieve targets
- 2022 – adopting the Zero Carbon Policy (included as Appendix 7) to ensure that the DCC's activities minimise emissions and contribute to achieving both Dunedin and DCC emissions reduction targets
- 2023 – introducing the DCC's procurement emissions standards
- 2024 – introducing permanent emissions consideration sections in all Council reports
- 2025 - including provision in the 9 year plan 2025-34 for a wide range of projects and initiatives that will reduce emissions, at both the Dunedin and DCC scales
- 2025 – embedding emissions considerations in the DCC's project management framework

DCC's approach to emissions management is guided by the Zero Carbon Policy

The DCC manages organisational emissions in accordance with the Zero Carbon Policy. The Policy commits the DCC to monitoring, measuring, reporting, managing, verifying and publicly reporting DCC emissions in line with the requirements of ISO 14064-1:2018 (a widely applied global standard).

Of relevance to this EMRP, the Zero Carbon Policy states the DCC will prioritise gross emissions reductions wherever possible.

The Zero Carbon work programme guiding principles adopted by Council in February 2022 are also of relevance to management of DCC emissions. They emphasise alignment with best practice. The 'Evidence-led' principle states *'We utilise data and evidence and strive to follow international best practice. We acknowledge the urgency of climate change mitigation and are committed to contributing to global efforts to limit warming to 1.5°C'.*

This EMRP sets out organisational targets and DCC's intended approach to reduce emissions (actions required to achieve targets). The DCC also produces an annual Inventory Management Report (IMR), which reports on the organisation's annual emissions, along with progress against EMRP actions.

Other considerations

The DCC is able to access a discounted interest rate from the Local Government Funding Agency (LGFA) under the Climate Action Loans programme. Borrowing under the Climate Action Loan programme requires councils to meet certain criteria, including: the emissions inventory being audited annually in line with the GHG Protocol or ISO 14064-1:2018 reporting standard; setting science-aligned emissions reduction targets; and having an emissions reduction plan outlining how the organisation aims to meet the emissions reduction targets. The EMRP helps meet these obligations.

Scope of this EMRP

The EMRP covers the DCC's own organisational emissions in line with the ISO 14064-1:2018 reporting standard, including those generated by our contractors and supply chain (as data allows).

The scope of the DCC emissions is determined using an 'operational control' consolidation approach. This includes activities undertaken by DCC staff (such as driving fleet cars, electricity usage) and emissions from DCC assets or services (such as LPG burnt at DCC pools, landfill gas from Green Island Landfill). It also includes emissions generated by significant suppliers undertaking work on behalf of the DCC, and emissions associated with some goods/consumables used in the course of DCC activity (e.g. chemicals for water treatment).

This document covers the period of 2025/26 through to 2029/30, aligned with the period covered by current Dunedin emissions reduction targets and the Zero Carbon Plan.

The EMRP will be periodically reviewed and updated during this time, including:

- in mid-2026, following Council decisions on city targets, and
- in mid-2027, following decisions on the DCC's next Long Term Plan.

All emissions in this EMRP are stated in tonnes of carbon dioxide equivalent (tCO₂e).

2.1 Emissions baseline

Having an appropriate emissions baseline is important to be able to accurately measure how successful emissions reduction efforts are over a period of time.

The DCC's 'baseline year' (the year against which progress is measured) is 2018/19. For some emissions sources the reporting methodology has changed since 2018/19, or data is unavailable due to the emissions source being recently added to the inventory. Where this is the case, the earliest data available has been assumed to represent baseline e.g. the DCC is using 2019/20 year as its baseline for Waste to Landfill, because it is the earliest year for which emissions data can be produced using the current methodology.

A detailed breakdown of the DCC's baseline is attached as Appendix 1, which notes emissions sources where data other than 2018/19 is used.

2.2 DCC emissions overview

In 2024/25 the DCC's largest emissions sources were Waste to Landfill (Green Island landfill), Wastewater Treatment (emissions associated with biological processes at wastewater treatment plants) and Closed Landfills. The DCC's Green Island Landfill receives waste from residents, business, and industry from across the city.

The next largest three emissions sources are Major Suppliers, Electricity, and Composting.

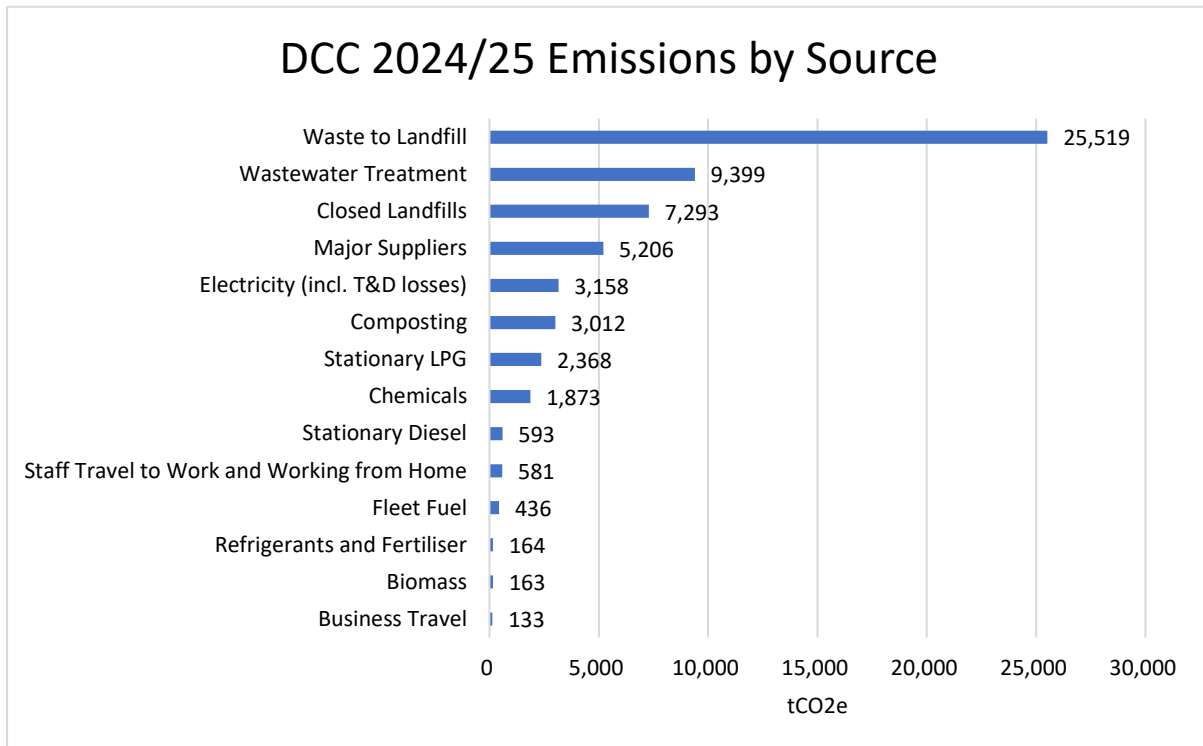


Figure 2: DCC Organisational Emissions Inventory for 2024/25 by emissions source

The full inventories for 2018/19, 2023/24 and 2024/25 are included under Appendix 3, along with 2029/30 targets for each emissions source.

A more detailed overview of each emissions source is included under *5. Emissions sources and reduction projects* section of this EMRP.

2.3 DCC's Emissions Reduction Targets

As set out in Table 1, the DCC's current short-term organisational emissions reduction targets are relative to the DCC's 2018/19 baseline, and apply to all DCC emissions. Internationally, guidance produced by the Science-based Targets Initiative (SBTi) is considered to represent best practice in terms of setting emissions reduction targets consistent with endeavours to limit global warming to 1.5°C above pre-industrial levels. The DCC has sought to align with current SBTi guidance, but is not intending to seek accreditation under SBTi.

Table 1: Short-term Organisational Emissions Reduction Targets

Scope of target	Target	2018/19 Baseline (tCO ₂ e)	Target date	Responsibility	Rationale
All DCC emissions	34.2% reduction in annual tCO ₂ e emissions	86,458	2026/27	Executive Leadership Team	Interim target to ensure DCC is tracking well to meet longer term 2029/30 target
All DCC emissions	46.2% reduction in annual tCO ₂ e emissions	86,458	2029/30	Executive Leadership Team	Science-aligned target for DCC to contribute towards effort to keep global warming below 1.5°C above pre-industrial levels

In terms of a long-term target, the DCC is committed to achieving net zero emissions no later than 2050, with target date subject to confirmation in early 2026.

2.4 Emissions modelling

Figure 3, Table 2 and Table 3 below show the emissions reductions projected to be achieved through delivery of the EMRP.

The modelled emissions track achieved with implementation of all EMRP projects is anticipated to reduce emissions 45% by 2029/30 against the baseline year. This falls slightly short of achieving the DCC's 2029/30 target (a 46.2% reduction in emissions over the same period). This shortfall is modelled to sit in Scope 3, and additional work is being undertaken to identify actions to close the gap.

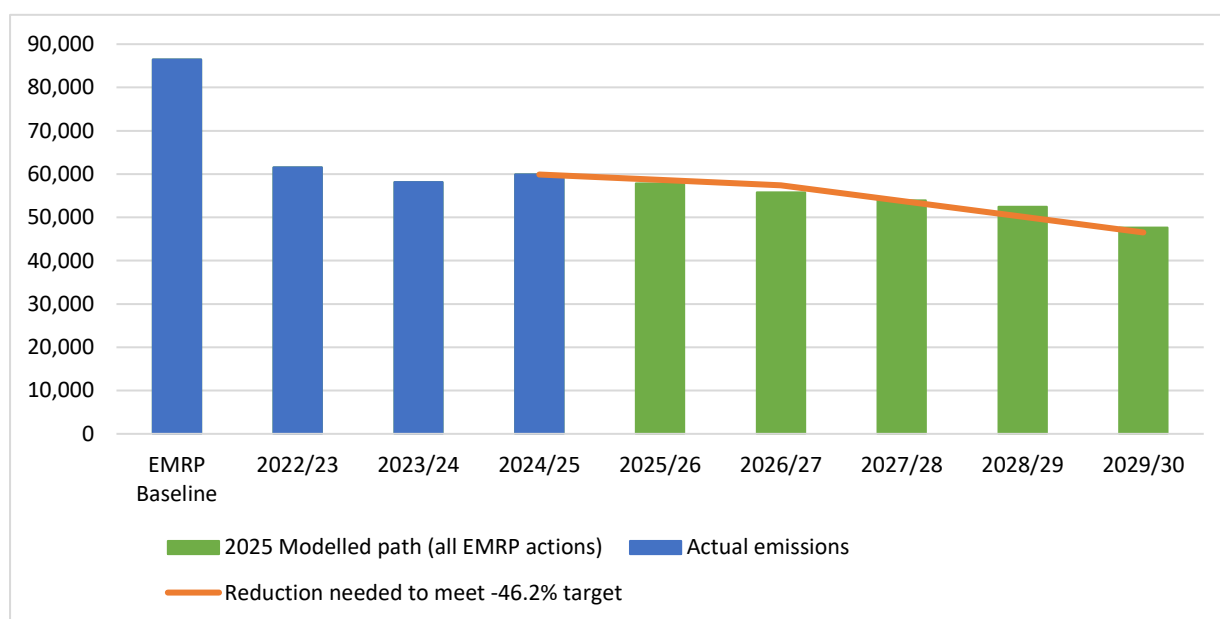


Figure 3: DCC emissions modelled to 2029/30 (tCO2e)

Table 2: Modelled emissions track to 2029/30 compared with current EMRP targets

Table 2: Emissions modelling to 2029/30 vs Science-Aligned Targets				
Modelling vs SBT	2018/19 Baseline (tCO2e)	Actual 2024/25 (tCO2e)	2026/27 (tCO2e)	2029/30 (tCO2e)
Emissions modelling (all EMRP actions)	86,458	59,896	55,784	47,647
Science-aligned target (34.2% reduction against baseline 2026/27, 46.2% reduction against baseline 2029/30)	86,458	59,896	57,408	46,514
Additional reduction required to meet 2029/30 science-aligned target				1,133

Table 3 below outlines the modelled emissions reductions by scope of emissions against DCC's science-aligned targets.

Table 3: Modelled emissions track to 2029/30 by Scope

Emissions modelling by Scope to 2029/30 vs Science Based Targets					
Scopes	Modelling vs SBT	2018/19 Baseline (tCO ₂ e)	Actual 2024/25 (tCO ₂ e)	2026/27 (tCO ₂ e)	2029/30 (tCO ₂ e)
Scope 1 and 2 (Category 1 and 2)	Emissions modelling (all EMRP actions)	78,021	51,840	50,038	41,443
	Science-aligned target (34.2% reduction against baseline 2026/27, 46.2% reduction against baseline 2029/30)		58,360	55,083	41,976
	Emissions modelling vs Scope 1 & 2 science-aligned target				-532
Scope 3 (Category 3-6)	Emissions modelling (all EMRP actions)	8,436	8,056	7,796	6,204
	Science-aligned target (34.2% reduction against baseline 2026/27, 46.2% reduction against baseline 2029/30)		6,310	5,956	4,539
	Additional reduction required to meet science-aligned target				1,666

3. Updates to DCC emissions reporting since last EMRP

Since the EMRP approved in June 2024, the DCC has added three new emissions sources to the organisational inventory. These are:

- **Composting** emissions from residential kerbside organics collections
- **Biomass** emissions from burning woodchips for pool water heating at Te Puna o Whakaehu, and space heating at the Botanic Gardens propagation facility
- **Sludge** disposed at a private landfill out of district

Primarily these emissions sources have been added to DCC's inventory as a result of changes in DCC operations (such as Te Puna o Whakaehu opening in June 2023). They are not sources that have previously been excluded from DCC's emissions inventory, except for a small amount of biomass that has historically been combusted for space heating at the Botanic Gardens propagation facility. As such, only emissions relating to biomass used at Botanic Gardens has been added to the DCC's baseline year.

To continue to better align with ISO 14064: 2018, the DCC is considering other possible inclusions in DCC's inventory:

- Expanded DCC supplier emissions reporting as emissions reporting clauses are embedded in new contracts
- Cloud based IT services emissions
- Emissions associated with products used by DCC (paper, IT equipment, other consumables, chemicals used in processes other than water and wastewater treatment)

The DCC is also in discussion with Dunedin City Holdings Ltd about the way that companies' inventories should be treated and reported under the DCC's 'operational control' consolidation approach, in light of evolving best practice.

4. Emissions Reduction Governance and Oversight

Reaching targets will require DCC teams to work together

Relevant DCC teams have provided input into the refresh of this EMRP.

Staff awareness of the DCC's EMRP and emissions reduction commitments is being developed through information published on the intranet, regular meetings with teams, and Executive Leadership Team/Steering Group leadership. Emissions considerations and prompts are now built into the DCC's project management framework, reporting templates, and procurement processes. Upskilling of key staff will occur through relevant webinars and training, and additional support is provided to teams and staff by the Zero Carbon team on an as-required basis.

Effective governance will support achievement of targets

The DCC's emissions reduction efforts at both the organisational and city-wide level are broad in scope and high in ambition. Effective oversight and governance of emissions reduction projects is critical to achievement of the targets for 2029/30.

The Executive Leadership Team oversees EMRP implementation. However, because of the high degree of integration and overlap between the EMRP and the Zero Carbon Plan, most actions in the EMRP are also subject additional levels of governance and oversight. Council has established a Zero Carbon Plan Advisory Panel to support Zero Carbon Plan implementation and achievement of its targets. The Advisory Panel comprises Council chairs and a mana whenua representative.

Monitoring and reporting

Since 2022, data for most emissions sources has been updated at least quarterly. There are some smaller

emissions sources such as refrigerant leakage which are updated only annually.

Detailed information on emissions tracking, as well as the progress on timebound EMRP projects is reported every six months to the Executive Leadership Team (ELT) and ultimately to Council. This enables supports timely review of emissions trajectories with the potential for intervention to course correct, and for issues with delivery of EMRP projects to be escalated as required.

Communicating our commitments

Once this EMRP has been adopted, it will be made publicly available on the DCC's website.

The DCC will continue to produce an annual Inventory Management Report (IMR) on its organisational emissions, and performance against the EMRP projects and targets. This will be externally verified and made publicly available on the DCC website.

Accountability

The Chief Executive Officer is the sponsor of the Zero Carbon work programme and is ultimately accountable for ensuring the programme achieves its objectives, including EMRP delivery and achievement of EMRP targets. The Manager - Zero Carbon, DCC is responsible for monitoring overall emissions inventory measurement and reduction performance, and reporting results to executive management/Council. The Manager – Zero Carbon is also responsible for work programme oversight, management and coordination.

Funding in the 9 Year Plan 2025-2034

Projects in the EMRP are based on funding levels set out in the 9 Year Plan 2025-2034.

A review of this EMRP is planned for July 2027, following adoption of the next Long Term Plan, at which point the level of funding for emissions reduction projects will have been confirmed for the period 2027-2037.

Emissions Intensity Indicators

The DCC include the following emissions intensity indicators as part of its annual Inventory Management Report. While these indicators are useful to measure the emissions intensity of DCC's organisational emissions compared with the number of residents within Dunedin City, the DCC's primary focus is to reduce total emissions in line with the overall emissions reduction targets for the organisation, rather than focus on a per capita emissions target.

Table 4: Emissions Intensity Metrics

Emissions Intensity Metrics	Baseline 2018/19	2022/23	2023/24	2024/25
Residents	131,200	131,300	131,300	131,800
Turnover/revenue (\$Millions)	286	334	355	402

Table 5: GHG emissions per Emissions Intensity Indicator (tCO₂e)

Emissions Intensity Indicator	Baseline 2018/19	2022/23	2023/24	2024/25
Total gross GHG emissions per resident	0.66	0.47	0.44	0.45
Total gross GHG emissions per Turnover/revenue (\$Millions)	302.30	184.31	163.88	149.00

5. Emissions sources and reduction projects

The sections below give an overview of each emissions source across DCC, as well as the emissions reduction projects included within this EMRP to address these emissions. Emissions sources have been listed in order, from the largest to the smallest, rather than by emissions category. A complete list of EMRP projects has been included as Appendix 2.

The actions listed in this plan are at varying points on the project lifecycle, with degrees of certainty regarding delivery. Many actions in the plan are fully scoped and costed and specifically provided for in 9 year plan budgets, with known delivery timeframes. For a smaller number of actions still in an “explore” or “investigate” phase, there is less certainty. For these actions, decisions to implement will be taken at the conclusion of investigations, when financial and resourcing implications are known.

Each section includes target emissions by 2029/30. An organisation-wide summary of the current emissions and target for 2029/30 has been included under Appendix 3. This has been modelled based on what is known now, based on the emissions reduction projects included in this report. As more detail becomes available about particular projects, the modelling and targets will be reviewed and updated.

5.1 All sources

Most DCC activities, projects and contracts involve multiple sources of emissions, which evolve and change as the organisation’s undertakes business-as-usual activity. In this context, proactive identification and management of potential new emission sources is necessary, in addition to the targeted actions addressing specific existing emissions sources that discussed elsewhere in this section.

The DCC’s Zero Carbon Policy requires all DCC activities to minimise emissions and contribute to the achievement of DCC and city emissions reduction targets. To give effect to the policy, the DCC has embedded emissions reduction considerations in procurement and reporting, and is building them into the organisation’s project management framework. Next steps include further work to integrate these new processes, tools and templates with each other, as well as staff training and support. Taken together, these actions will help drive down emissions across all sources, by promoting early consideration of lower emissions alternatives, and enabling emissions-related performance to be clearly and transparently considered through procurement processes.

Table 6: All Sources Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
C2.4.3	<i>Implement the Zero Carbon Policy to ensure DCC activities minimise emissions and contribute to the achievement of emissions reduction targets</i>	Ongoing	Zero Carbon
C2.4.3a	<i>Implement a standardised approach to give effect to the Zero Carbon Policy through project management, including guidance and support for DCC staff and suppliers</i>	2025/26	Zero Carbon
C2.4.3b	<i>Continue to ensure that relevant Council reports set out how options and recommendations give effect to the Zero Carbon Policy.</i>	Ongoing	Zero Carbon
C4.8.1	<i>Continue to implement a standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers</i>	Ongoing	Procurement

C4.8.1a	Monitor and manage performance against emissions reporting and reduction actions associated with contracted work and services.	Ongoing	Across DCC
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5.2 Waste

Waste makes up most of the DCC's emissions inventory, accounting for **70% of the baseline year emissions, and 60% of DCC's 2024/25 emissions** (42.6% from waste to Green Island landfill, 12.1% from closed landfills and 5% associated with composting). More specifically, waste to Green Island landfill is by far the largest single emissions source within DCC's inventory. Waste entering Green Island landfill includes waste deposited by community and businesses, and from kerbside collections. It is included in the DCC's inventory because DCC is the owner of the landfill. Methane emissions are generated from landfilled waste as organic materials decay trapped underneath inorganic materials such as building rubble or plastics.

Emissions from waste to landfill have reduced significantly in recent years, with 2024/25 Green Island landfill emissions approximately half of baseline emissions. This reduction is primarily due to improvements to landfill gas capture and destruction, with waste volumes between 2018/19 and 2024/25 relatively stable. The introduction of kerbside residential food and garden organics collection in 2024/25 also contributes to reduced Green Island landfill emissions.

Table 7 compares the Waste emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 7: Modelled path for Waste emissions

Emissions Source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change
Green Island Landfill	51210	25519	18352	
Composting	0	3012	3890	-57%
Closed landfills	9684	7293	5634	-42%
Total	60895	35824	27876	-54%

Waste to Landfill and Composting emissions

The Zero Carbon Plan includes many actions to address emissions from waste which have been incorporated into this EMRP. These include focusing on bringing about three key changes:

- More circular use of resources
- More diversion of waste from landfill
- Improved landfill and wastewater gas management.

Waste to Landfill and Composting emissions are intertwined. While DCC anticipate some growth in composting emissions in 2029/30 as organic waste sources are diverted from landfill, emissions from composting are significantly lower than those from landfill. The material from composting also becomes a useful resource, compared with the contaminated material resulting from landfilled waste.

EMRP actions to achieve these goals are included in Table 8 below. There are some actions which will not be easily measured within the DCC's inventory if the waste source is inert (does not directly cause emissions in landfill), such as diversion of greater quantities of construction and demolition waste for beneficial re-use. Such actions are anticipated to have emissions reduction benefits at the city-scale, for example through reductions in freight and broader emissions reduction benefits beyond Dunedin city boundaries through greater re-use of materials rather than newly manufactured materials.

Table 8: Waste Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
R1.1.1	Continue to develop and support existing resource recovery parks: Green Island, Waikouaiti, Middlemarch	Ongoing	Waste and Environmental Solutions (WES)
R1.1.2	Develop a central city location for collection of recyclable materials and sale of diverted items (a 'second Rummage store')	2026/27-2027/28	WES
R1.1.3	Provide rural recycling hubs	2025/26-2033/34	WES
R1.1.4	Work with community partners to support three or more communities to establish new community-led resource/recycling centres in local neighbourhoods	2025/26-2027/28	WES
R1.1.5	Complete business case for a wider network of community-led resource/recycling centres in local neighbourhoods	2025/26	WES
R1.1.6	Support communities to operate and develop community-led resource/recycling centres into self-sustaining operating models	2025/26-2027/28	WES
R1.1.7	Work with community partners to progressively expand the network of community-led resource/recycling centres	2023/24-2030/31	WES
R1.1.8	Continue to support/run and grow a calendar of community events and education to divert household items from landfill, including repair cafes and Para Kore	Ongoing	WES
R1.1.9	Delivery City Recycling Hubs	2025/26-2033/34	WES
R1.2.1	Expand supports for waste minimisation education, projects, facilities, and services to include initiatives that support resource circularity, and to ensure that key services can access multi-year funding.	2023/24-2030/31	WES
R1.2.2a	Progress collaborative work on circular economy with partners	Ongoing	Zero Carbon
R1.3.1	Construct new Green Island composting facility	2025/26-2026/27	WES
R1.3.3	Explore options to prevent organics entering DCC owned landfills once alternative disposal solutions are available	2026/27	WES
R1.3.4	Encourage and support waste-related improvements to regional planning documents, including improved provisions for composting	Ongoing	WES
R1.4.1	Construct Green Island facility for storing timber diverted from landfill	2025/26-2027/28	WES
R1.4.2	Continue collaborating with other councils to identify or create solution for timber and other regional waste processing infrastructure	Ongoing	WES
R1.4.3	Explore with community partners the potential for construction waste re-use hub(s)	2025/26	WES
R1.4.4	Support the establishment and operation of construction waste re-use hub(s)	2026/27-2027/28	WES
R1.4.5	Explore options for incentives to encourage low carbon, circular, low waste design for construction projects	2025/26	WES
R1.4.6	Implement incentives for low carbon, circular, low waste design for construction projects	2025/26-2030/31	WES
R1.4.7	Explore ways to support the establishment and operation of building deconstruction services	2025/26	WES
R1.4.8	Support the establishment and operation of building deconstruction services	2025/26-2030/31	WES

R1.4.9	Deliver a pilot programme for construction waste separation	2025/26	WES
R1.4.10	Undertake and publish case studies on separating construction waste and reducing waste in design	2025/26	WES
R1.4.11	Publish information about best practice for reducing construction material use and waste through design and construction	2025/26	WES
R1.5.1	Continue to expand provision of waste minimisation information and education, including developing an online information hub, a mobile waste education unit and delivering a business education programme	Ongoing	WES
R1.5.2	Construct new resource recovery park at Green Island to provide infrastructure for waste diversion	2025/26-2027/28	WES
R1.5.4	Explore how to best support businesses to undertake waste audits and develop waste minimisation plans	Ongoing	WES
R1.5.5	Support business to undertake waste audits and develop waste minimisation plans	Ongoing	WES
R1.6.3	Undertake study to determine source of paper sent to landfill	2025/26	WES
R1.6.4	Use findings from R1.6.3 to plan and implement actions to reduce, re-use, or recycle paper	2025/26-2030/31	WES
R1.6.5	Undertake study to determine source and composition of textiles sent to landfill	2025/26	WES
R1.6.6	Use findings to plan and implement actions to reduce, re-use, or recycle textiles	2025/26-2030/31	WES
R3.7.1	<i>Complete business case for bioresources facility</i>	2025/26	3 Waters
R3.7.2a	<i>Deliver bioresources facility (Phase 1 - 2000T per annum)</i>	2026/27-2029/30	3 Waters
R3.8.3	Continue work to optimise gas capture and destruction at Green Island Landfill	Ongoing	WES

Closed landfill emissions

Emissions from waste continue long after it has been deposited in landfill, due to organic materials being trapped underneath inorganic materials, leading to the slow decay (or break down) of organic material over many years and decades.

The DCC's inventory includes reporting from closed landfills managed and owned by the DCC: North Taieri, Middlemarch, Forrester Park, Sawyers Bay and Waikouaiti. There are no actions included within this EMRP to address closed landfills emissions. The scale and form of each landfill make it unviable to reduce methane emissions through actions such as capture and destruction of landfill gas. However, the DCC is working to maximise landfill gas capture at Green Island landfill, to ensure the long-term impacts of that landfill are mitigated as much as possible once it is closed.

Figure 4 below shows the projected closed landfill emissions through to 2030 if no intervention is taken. As such, DCC can expect to see emissions decline from DCC owned closed landfills over the coming years.

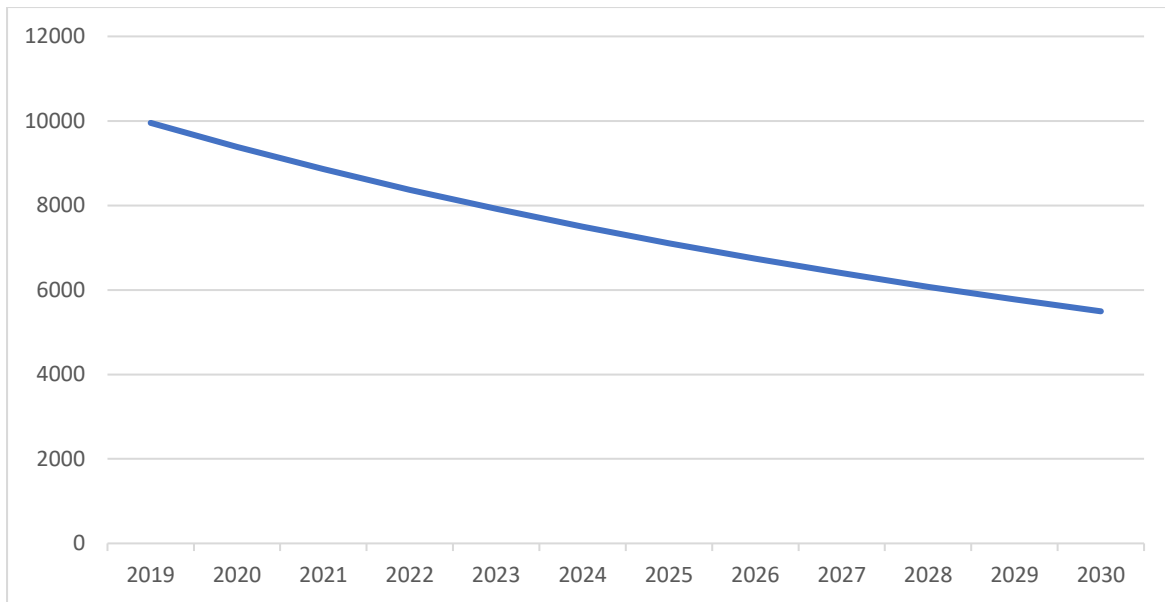


Figure 4: Projected closed DCC landfill emissions 2019-2030

Waste generated from DCC operations

Emissions associated with waste generated by DCC's own operations are included in DCC's inventory as Scope 0. This is because emissions from waste generated from DCC buildings and facilities is deposited at Green Island landfill and is already accounted for as Category 1/Scope 1 emissions. DCC have previously completed waste audits for the Civic Centre building, with waste minimisation initiatives such as recycling and paper towel replacement implemented.

In the 2024/25 financial year, 60.79tCO2e of emissions associated with waste generated by DCC operations entered the landfill. This is up from 47.14tCO2e in 2022/23 and down from 123.5tCO2e in the baseline year.

Actions related to project management and procurement captured in Table 8, above, will drive down waste generated by the DCC. DCC are working to capture data on, and manage down waste generated by DCC suppliers (see section 5.4 Major Suppliers). However, as indicated above, it will be important to ensure these emissions are not double counted given all emissions from Green Island landfill are captured in the DCC's reporting.

5.3 Wastewater Treatment

Emissions generated by biological processes at wastewater treatment plants (WWTPs) while treating wastewater are the third largest emissions source within DCC's inventory, accounting for **11% of DCC's baseline emissions, and 16% of DCC's 2024/25 emissions**. Emissions from operation of WWTPs and disposal of sludge are also significant within Waste to Landfill emissions (sludge deposited at Green Island landfill) and Stationary Diesel emissions (Tahuna, Mosgiel and Green Island WWTP stationary diesel usage). Most sludge at Tahuna WWTP is currently incinerated, with the residual ash deposited at Green Island landfill. At present excess sludge that cannot be incinerated at Tahuna WWTP is primarily landfilled out of district. Digested sludge from Green Island WWTP and Mosgiel WWTP continues to be deposited at Green Island landfill.

Table 9 compares the Wastewater Treatment emissions baseline and 2024/25 emissions with the modelled position at 2029/30, by site.

Table 9: Modelled path for Wastewater Treatment Plant emissions

Emissions source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Tahuna WWTP	5219	5140	5140	-5%
Green Island WWTP	3644	3199	3199	
Mosgiel WWTP	743	741	741	
Small WW facilities (Middlemarch, Warrington, Waikouaiti, Seacliff)	278	278	278	
Sludge disposed at private landfill	0	41	0	
Total	9884	9358	9358	

The modelled emissions track to 2029/30 is based on an assumption that Wastewater Treatment emissions are maintained at 2024/25 levels. There are likely to be emissions reduction opportunities identified through direct measurement of methane and nitrous oxide emissions at WWTPs, and also through insights from improved wastewater treatment emissions reporting, now that it is automated and time sensitive.

Table 10 sets out EMRP actions based on the DCC's current knowledge base. When this EMRP is reviewed, the emissions reduction target for wastewater treatment plants will also be reviewed and updated as required, along with additional emissions reduction projects being added if appropriate.

Table 10: Wastewater Treatment Plant Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
R3.7.1	<i>Complete business case for bioresources facility</i>	2025/26	3 Waters
R3.7.2a	<i>Deliver bioresources facility (Phase 1 - 2000T per annum)</i>	2026/27-2029/30	3 Waters
R3.8.4	Deliver a gas flare at Mosgiel Wastewater Treatment Plant	2025/26	3 Waters
R3.8.5	Undertake monitoring and explore other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes	2025/26-2026/27	3 Waters
R3.8.6	Implement other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters

5.4 Major Suppliers

Major suppliers generated **6% of DCC's baseline emissions, and 9% of DCC's 2024/25 emissions.**

Table 11 compares the Major Suppliers emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 11: Modelled path for Major Supplier emissions

Emissions source	2022/23 (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Fleet Fuel (including machinery such as excavators)	4937	4680	3216	-35%
Asphalt Production	443	377	443	0%
Other	134	149	133	0%
Total	5514	5206	3792	-31%

DCC's inventory includes emissions associated with suppliers undertaking work on DCC's behalf. DCC first reported emissions from nine key suppliers considered to be the most emissions intensive in 2021/22. Since then, as existing contracts expire and new services are procured, new contracts include emissions reporting clauses where appropriate. This has led to a further three suppliers reporting their emissions. The twelve suppliers include roading maintenance and construction, 3 Waters pipeline renewals and maintenance, rubbish/recycling/organics collection, landfill management, parks and recreation maintenance, and security services.

As shown in table 9 above, in 2024/25 around 90% of the emissions from suppliers reflect fleet (and machinery) fuel consumption, and 7% from asphalt production.

As existing contracts expire all suppliers with material emissions will be required to provide emissions data, in line with the DCC's *Procurement Emissions Standards*¹. DCC process improvements will also enable DCC to track whether suppliers are meeting the emissions reduction targets included in their contracts. As a result of these improvements in measurement and suppliers' reporting, reported emissions from major suppliers are expected to increase. The growth of the DCC's capital delivery programme is also anticipated to be a factor in growth of this emissions source.

Table 12 sets out actions relating to Major Suppliers. The Zero Carbon Policy and associated actions are the primary tool in managing down emissions from this source. The emissions modelling is based on contractors' fleet meeting certain minimum requirements in the coming years through to 2029/30. With Zero Carbon considerations embedded in the DCC's project management framework, there are likely there will be further opportunities to reduce emissions, including through emerging technology in and smarter design. Modelling will be reviewed over time as the impact of current measures takes effect.

Table 12: Major Suppliers Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
C2.4.3a	<i>Implement a standardised approach to give effect to the Zero Carbon Policy through project management, including guidance and support for DCC staff and suppliers</i>	2025/26	Zero Carbon

¹ https://www.dunedin.govt.nz/_data/assets/pdf_file/0010/1001035/supplier-guidance-for-procurement-emissions-standards.pdf

C2.4.3b	<i>Continue to ensure that relevant Council reports set out how options and recommendations give effect to the Zero Carbon Policy</i>	Ongoing	Zero Carbon
C4.8.1	<i>Continue to implement a standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers</i>	Ongoing	Procurement
C4.8.1a	<i>Monitor and manage performance against emissions reporting and reduction actions associated with contracted work and services</i>	Ongoing	Across DCC

5.5 Stationary Energy

When combined, stationary energy emissions from electricity, diesel, biomass and LPG use in DCC buildings and facilities are almost as large as wastewater treatment emissions, generating **7.7% of DCC baseline emissions and 11% of 2024/25 emissions**. Across all stationary energy sources, there is an overarching need to both optimise efficiency and to decarbonise energy usage.

There are connections between the end-uses of electricity, biomass, LPG and stationary diesel used at DCC (a variety of fuels might be use in one facility). An overview of electricity, LPG and stationary diesel use is covered below, followed by all the emissions reduction projects relating to stationary energy.

Biomass woodchips are currently only used at two DCC facilities – to support propagation at the Botanic Gardens, and to heat pool water at Te Puna o Whakaehu in Mosgiel. The use of biomass provides a low carbon energy source in both of these facilities – there are no specific actions in this EMRP targeting Biomass emissions reduction.

Table 13 compares the Stationary Energy emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 13: Modelled path for Stationary Energy emissions

Emissions source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Electricity (incl. T&D losses)	4003	3158	2585	-35%
Stationary Diesel	753	593	566	-25%
Stationary LPG	1909	2368	625	-67%
Biomass	9	163	163	N/A
Total	6673	6281	3938	-41%

Electricity (including transmission and distribution losses)

Electricity generated **4.6% of DCC's baseline emissions and 5% of 2024/25 emissions**.

Energy efficiency projects across DCC (such as upgrading streetlights and sports field lights to LEDs) have resulted in a 25% reduction in electricity consumption between 2018/19 and 2024/25.

Several EMRP actions aim to either improve electricity efficiency or generate electricity to reduce the need for electricity from the national grid and to reduce DCC's electricity consumption. However, DCC's overall electricity consumption may increase, as large DCC buildings and facilities are decarbonised and switch from LPG. The switch in fuel type from LPG to electricity is expected to result in significant reductions in overall emissions across DCC.

Modelling of electricity emissions anticipates the increase in emissions from electricity consumption will be offset by improvements in energy efficiency and greater renewable energy generation in the national

electricity grid. The modelling assumptions will be reviewed over time as more detailed information becomes available for each project and changes are made (or not made) to the national grid.

Stationary Diesel

Stationary diesel generated 0.9% of DCC's baseline and 1% of 2024/25 emissions.

Table 14 compares the Stationary Diesel emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 14: Modelled path for Stationary Diesel use by site

Location	2022/23 (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Tahuna WWTP	650	472	500	-23%
Green Island WWTP	44	2	7	-84%
Mosgiel WWTP	131	75	27	-79%
Musselburgh WW PS/screening plant	40	40	11	-72%
Southern Water Treatment Plant	100	4	20	-80%
Botanic Gardens	3	0	0	-100%
Total	968	593	566	-42%

The majority of stationary diesel is used at the Tahuna Wastewater Treatment Plant (WWTP) to operate the sludge incinerator. Short term actions to optimise use of the incinerator, such as installing an ash clarifier to remove ash from the incinerator, have been completed between 2024 and 2025. This has reduced the amount of diesel required to incinerate sludge by approximately 20% compared with baseline year usage. This is because the higher the percentage of ash is mixed with the sludge, the more heat is required to burn the remaining organic material, so removing the ash reduces the energy required.

In the long term, however, emissions from stationary diesel can be greatly reduced if an alternative to incinerating sludge at Tahuna WWTP is implemented. This EMRP includes actions related to exploring and implementing a biosolids solution to beneficially re-use sludge produced at Green Island and Mosgiel WWTPs, however at present there is insufficient funding in the Long Term Plan for sludges produced at Tahuna WWTP to be beneficially re-used in a biosolids facility. Rather, the funding in the Long Term Plan enables sludge from Green Island and Mosgiel WWTPs to be beneficially re-used rather than landfilled, with the Tahuna sludge incinerator retained. As such, the sludge incinerator will remain in operation over the term of this EMRP. This may change in future if a more cost effective beneficial re-use biosolids solution is found, or if funding levels increase.

Stationary diesel is used at Green Island and Mosgiel WWTPs to heat the digesters when the biogas system is not working, and to supplement electric pumps during periods of high rainfall. Ensuring the operation of the biogas boilers at both Green Island and Mosgiel WWTPs is optimised has significantly reduce baseline stationary diesel consumption from these sites up to the end of 2024/25.

Stationary diesel is also used for remote or short-term power generation at other sites within the 3 Waters network, such as to power small pump stations. Completely displacing the use of diesel for power generation in severe weather events or remote locations may be difficult, however DCC will investigate what options are available to reduce reliance on stationary diesel for such purposes.

There is also a small amount of stationary diesel used at Botanic Gardens annually to support propagation of plants, in addition to the biomass heating in this facility. The DCC is exploring what alternatives to diesel may be available.

Stationary LPG

Stationary LPG generated 2.2% of DCC's baseline emissions and 4% of 2024/25 emissions.

Table 15 compares the Stationary LPG emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 15: Modelled path for stationary LPG use by site

Location	2022/23 (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Moana Pool	1100	1347	440	-60%
Andersons Bay Crematorium	190	171	108	-43%
Caledonian Gym	67	0	0	-100%
Civic Centre/Library	372	400	0	-100%
Dunedin Public Art Gallery	236	269	0	-100%
Toitū Early Settlers Museum	74	78	0	-100%
Uni Oval	11	16	11	0%
St Clair saltwater pool café	11	12	11	0%
Memorial Gym, Mosgiel	35	54	35	0%
Other DCC sites	90	20	20	-78%
Total	2113	2368	625	-70%

The majority of DCC stationary LPG is used to heat Moana Pool, operate the cremators at Andersons Bay Crematorium, and for space heating at DCC buildings in the CBD. As shown in the table above, there is also a reasonable amount used at Memorial Gym in Mosgiel and Caledonian Gym.

The previous EMRP anticipated that LPG use at Moana Pool would be completely displaced by 2029/30, however following more detailed investigation of feasibility, and existing funding levels, LPG use at Moana Pool is now anticipated to be reduced by up to 60% by 2029/30. This is based on a new heat recovery system being implemented, which both recovers heat more efficiently than the current system and recovers heat across more of the pools at Moana than the present system does.

Projects in this EMRP displace LPG use at the DCC buildings in the CBD (Civic Centre/Library, Dunedin Public Art Gallery, Toitū Early Settlers Museum) by 2029/30. The LPG boiler at the Caledonian Gym has reached the end of its life, and is no longer operational. The boiler will not be replaced with a like-for-like system. As such, there are no LPG emissions anticipated from the Caledonian Gym in 2029/30.

Alternatives to the use of LPG at Andersons Bay Crematorium have been investigated and excluded for a variety of reasons. There is a project to install oxygenators in the cremators at Andersons Bay Crematorium, which is anticipated to reduce the LPG consumed at this site.

The remaining approximately 100 tCO₂e in 2024/25 was used at Memorial Gym, University Oval, St Clair saltwater pool café, and a number of other buildings and facilities across DCC. In many instances, LPG is used

to heat hot water in settings where alternative energy sources are impractical or inefficient at present, due to demand only at limited times (such as hot water for sports field changing rooms which may have little to no use during weekdays but peak requirements on weekends after sports matches). These smaller sources are not a focus of DCC within this EMRP, however may be reviewed in future following larger LPG sources being replaced with low emissions alternatives, and potential technology improvements for short term, high demand water heating.

Stationary Energy Emissions Reduction Projects

Table 16 sets out actions relating to Stationary Energy.

Table 16: Stationary Energy Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
C4.8.1	<i>Continue to implement a standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers</i>	Ongoing	Procurement
E1.2.1	Deliver heat recovery system at Moana Pool	2025/26-2026/27	Parks and Recreation Services (PARS)
E1.2.4a	Plan and deliver Civic Centre efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2027/28-2028/29	Property
E1.2.4b	Plan and deliver Dunedin City Library efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2027/28-2028/29	Property
E1.2.4c	Plan and deliver Dunedin Public Art Gallery efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2028/29-2029/30	Property
E1.2.4d	Plan and deliver Toitū Otago Settlers Museum efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2026/27-2027/28	Property
E1.2.4e	Plan and deliver Town Hall and Municipal Chambers efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2028/29-2029/30	Property
E1.2.7a	Explore and implement options to displace stationary diesel use and improve energy efficiency at 3 Waters facilities as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters
E1.2.11	Implement preferred option to improve the overall energy efficiency and reduce LPG use at Andersons Bay Crematorium	2025/26-2026/27	PARS
E1.2.12	Explore and implement other upgrades to improve energy efficiency and displace stationary diesel and LPG use at other PARS facilities as part of relevant asset management and capital works programmes	Ongoing	PARS
E3.4.1a	Explore options for renewable energy generation associated with 3 Waters assets, as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters
E3.4.4	Explore and implement options for renewable energy generation associated with other DCC assets, as part of other energy efficiency and decarbonization work programmes	Ongoing	Property
R3.7.1	<i>Complete business case for bioresources facility</i>	2025/26	3 Waters
R3.7.2a	<i>Deliver bioresources facility (Phase 1 – 2000T per annum)</i>	2026/27-2029/30	3 Waters

5.6 Chemicals

Chemical use **generated 2% of DCC's baseline emissions and 3% of 2024/25 emissions.**

Table 17 compares the Chemicals emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 17: Modelled path for Chemicals emissions

Emissions source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Chemicals	1660	1539	1539	-7%
Freight	468	333	333	-29%
Total	2128	1876	1876	-12%

The 3 Waters carbon baseline report completed in 2021/22 identified that chemical use was a significant emissions source. For this reason, it has been included in emissions reporting since 2021/22. Chemical manufacture and use (including freight) generated 2128 tCO₂e in 2022/23, and 1876 tCO₂e in 2024/25.

An EMRP action has been included to identify opportunities to reduce chemical emissions, including exploring actions such as optimising water treatment processes, and identifying whether there are suppliers closer to Dunedin to reduce freight emissions. Emissions from this source have decreased 12% between the baseline year and 2024/25, through both optimising the use of chemicals in water treatment processes, and greater use of local suppliers.

Table 18 sets out actions relating to Chemicals.

Table 18: Chemicals Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
R1.6.7	Ensure all major chemicals used within DCC are included within emissions data, including but not limited to aquatics chlorine use, and liming of sludge at Tahuna WWTP	Ongoing	3 Waters
R1.6.8	Identify opportunities to reduce emissions from chemicals use, and implement changes	Ongoing	3 Waters
R1.6.9	Deliver water treatment plant process optimisation to reduce chemical use	2026/27-2032/33	3 Waters

5.7 Staff Travel to and From Work

Staff travel to and from work **generated less than 1% of DCC's baseline emissions, and 1% of 2024/25 emissions.** These emissions are significant in the context of DCC's overall inventory, and exceed the emissions associated with DCC's own fleet.

Table 19 compares the emissions baseline for Staff Travel to and from Work with 2024/25 emissions from this source, and the modelled position at 2029/30.

Table 19: Modelled path for Staff Travel to and From Work emissions

Emissions Source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Staff travel to work (alone and carpooling) – ICE + Hybrid	432	514	214	-45%
Staff travel to work – Motorcycle/Motor scooter (km)	9	5	9	
Staff travel to work – E-scooter (km)	0.03	0.21	0.03	
Staff travel to work – Bus (km)	49	56	42	
Staff travel to work – EV (alone and carpooling)	2	4	4	
Staff travel to work – bike	0	0	0	
Staff travel to work – walk	0	0	0	
Staff travel to work – taxi	0.14	0.16	0.14	
Total	492	579	269	

Changing the way staff travel to and from work across Dunedin is also a key aspect of meeting the targets in the Zero Carbon Plan.

As shown in the table above, almost 90% of the staff travel to/from work emissions are caused using private fossil fuel powered vehicles. Staff travel survey data indicates many would like to travel by more sustainable modes of transport, however face difficulties in doing so. Some staff are unlikely to be able to switch from use of a private vehicle to more sustainable transport modes in the short to medium term due to their personal circumstances. The emissions reduction projects included for staff travel to/from work (Table 20, below) seek to remove or lower the barriers for staff to switch from use of private vehicles to more sustainable travel modes such as catching the bus, cycling, e-biking/e-scootering, or walking.

The projected emissions by 2029/30 for staff travel to/from work are based on DCC staff travel choices reflecting the targets included in the Zero Carbon Plan for metrics such as how many trips within the city are via cycling, walking, and public transport compared with private car trips.

Table 20: Staff Travel to and from Work Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
T3.7.2a	Implement flexible working policy across DCC to enable working from home where appropriate	Ongoing	Across DCC
T5.15.7a	Explore options to encourage and enable greater uptake of public transport by DCC staff	2025/26	Transport
T5.15.7b	Implement preferred initiative to support greater uptake of public transport by DCC staff – please note that a decision on this action is deferred until all implications are known, including financial and resourcing.	Ongoing from 2026/27	Transport
T5.15.7e	Investigate options to encourage and enable greater uptake of e-bikes by DCC staff	2025/26	Transport
T5.15.7f	Implement preferred e-bike option for DCC staff – please note that a decision on this action is deferred until all implications are known, including financial and resourcing.	Ongoing from 2025/26	Transport

T5.15.7g	Review and upgrade as necessary DCC end of trip facilities, such as bike parking	Ongoing	Transport
T5.15.7h	Promote end of trip facilities for DCC staff	Ongoing	Transport
T5.15.7i	Produce internal DCC communications and engagement on sustainable travel options and initiatives	Ongoing	Transport
T5.15.7j	Continue to undertake annual DCC staff travel surveys	Ongoing	Transport

5.8 Fleet Fuel

Fleet fuel **generated less than 1% of DCC baseline emissions and 1% of 2024/25 emissions.**

Table 21 compares the Fleet Fuel emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 21: Modelled path for Fleet Fuel emissions

Emissions Source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 relative to baseline)
Fleet Fuel – Diesel	328	355	306	-7%
Fleet Fuel – Petrol	160	81	35	-78%
Total	488	436	341	-30%

Emissions from DCC petrol vehicles have decreased in recent years due to investments in plug-in hybrid (PHEV) and electric vehicles (EV). To date the DCC have not reported the electricity emissions associated with charging of PHEVs and Evs under fleet emissions, with the electricity consumption from vehicles included in overall stationary electricity emissions.

While petrol use has been declining, DCC's diesel use from fleet has been increasing modestly in recent years, largely due to 3 Waters activity. This is a priority area for DCC to address through fleet emissions reduction projects.

DCC and Customfleet worked together through 2023 to undertake a fleet optimisation study. The aim of this study is to identify ways to better utilise our fleet, including opportunities to reduce the number of vehicles in the fleet, better utilise existing PHEV vehicles in the fleet, and identify a pathway to have zero tailpipe emissions from DCC fleet vehicles. The final report was provided in late 2023, with implementation of the recommendations to occur in 2024 and beyond. The report has indicated several vehicles could be removed from DCC's fleet in the short term, and over the next 5-7 years all vehicles could be replaced with no tailpipe emissions alternatives and alternatives to DCC fleet options such as carshare, e-bikes or use of public transport (pending a greater market supply of EV utility vehicles, and sufficient charging infrastructure). The 2029/30 target emissions for fleet are based on levels of funding for fleet replacements and charging infrastructure in the 2025-2034 9 Year Plan, and falling short of the Fleet Optimisation Study's findings that all fleet vehicles could be replaced by electric alternatives by 2030.

Achievement of the emissions reduction targets for DCC fleet is also important to align with the expectations DCC has of its suppliers and the Zero Carbon Plan. As such, it is important DCC can illustrate the changes it has made in its own fleet over the coming years to show leadership in this area.

EMRP actions to reduce emissions from Fleet Fuel are set out in Table 22.

Table 22: Fleet Fuel Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
T5.15.8	Continue to optimise and electrify the DCC fleet as part of asset renewals	Ongoing	Fleet
T7.21.3	Invest in infrastructure to support continued DCC fleet electrification	2025/26	Property

5.8 Business Travel

Business travel **generated less than 1% of DCC's baseline and 2024/25 emissions.**

Air travel emissions were significantly higher in the EMRP baseline of 2018/19 than the projected emissions by 2029/30. Since 2018/19, air travel usage by DCC staff has significantly reduced, with 106tCO₂e associated with air travel in 2024/25 compared with 312.07tCO₂e in 2018/19. It is considered this in part driven by behaviour change following the COVID-19 pandemic, technological improvements to video conferencing options, and an organisation wide target to halve air travel emissions in the 2021-23 EMRP.

Table 23 compares the Business Travel emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 23: Modelled path for Business Travel emissions

Emissions Source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Air Travel	312	106	68	-78%
Hotel Stays	1	2	2	25%
Rental cars	0	1	0.20	N/A
Taxis	2	1	1	-74%
Private cars	21	23	16	-25%
Total	337	133	87	-74%

This EMRP has an action to continue to reduce DCC air travel, using a variety of initiatives as appropriate such as managing travel budgets and encouraging alternatives to travel (Table 24, below). There are no specific actions to reduce hotel stays, rental cars, and taxi emissions. These sources are largely proportional to the amount of air travel that occurs and are a minor part of DCC's inventory.

There are no specific actions included in this EMRP to address private car emissions (private car use by staff which is reimbursed by DCC). Private car use is in part related to staff travelling to and from the airport in their own vehicle. As such, achieving the air travel target should result in some reduction in private car emissions.

Table 24: Business Travel Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>).	Timeframe	Lead team
T5.15.9	Implement initiatives to reduce DCC air travel, including managing team travel budgets and encouraging alternatives to travel and/or alternative travel modes, as appropriate	Ongoing	Executive Leadership Team

5.9 Fertiliser and Refrigerants

Fertiliser and refrigerants combined **generated less than 1% of DCC's baseline and 2024/25 emissions.**

Table 25 compares the Fertiliser and Refrigerants emissions baseline and 2024/25 emissions with the modelled position at 2029/30.

Table 25: Modelled path for Fertiliser and Refrigerant emissions

Emissions Source	Baseline (tCO ₂ e)	2024/25 (tCO ₂ e)	2029/30 target (tCO ₂ e)	% change (29/30 target relative to baseline)
Refrigerant Leakage	369	149	100	-73%
Fertiliser	33	14	12	-64%

Emissions from fertiliser come from nitrogen applied to DCC operated recreational facilities across Dunedin city. No alternative to the use synthetic fertilisers has been identified to ensure there is enough grass cover across sports fields, in particular for winter sports. Fertiliser is a relatively minor emissions source for the DCC, and given the lack of known alternatives at this point in time, there are no actions within this EMRP to address this emissions source.

Refrigerant leakage across DCC facilities has the potential to become an increasing risk over the coming years as existing LPG boilers are likely to be replaced with electric heat pump technology which utilises refrigerants. Although some refrigerants have very high global warming potential (GWP) if released into the atmosphere, emerging technologies using refrigerants with far lower GWP are becoming available.

Effective management of existing refrigerant systems, as well as careful selection of refrigerant systems to install, will be important to ensure emissions from refrigerants are minimised in the coming years. The DCC have recently moved to more proactive management of refrigerant leaks in 2024/25, using leak detection technology. This has led to leaks being dealt with and resolved sooner, reducing the amount of refrigerants leaked into the atmosphere. There are two EMRP projects relating to refrigerants (Table 26, below). The second project includes ensuring low GWP refrigerants are sought in major procurement that includes a system with refrigerants.

Table 26: Refrigerants Emissions Reduction Projects

Zero Carbon Plan action #	Description (<i>italics indicate project addresses more than one emissions source</i>)	Timeframe	Lead team
C4.8.1	<i>Continue to implement a standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers</i>	Ongoing	Procurement
E4.6.1	Continue to reduce the GWP of refrigerants on DCC property, as part of other energy efficiency and decarbonization work programmes	Ongoing	Property

Appendix 1: Baseline Emissions Recalculation Policy and Baseline Summary Table

Baseline Emissions Recalculation Policy

The following instances shall require a recalculation of DCC's base year emissions to ensure comparisons against the base year remain relevant:

- Structural changes that have a significant impact on the DCC's base year emissions. For example, as more suppliers report their emissions to the DCC when existing contracts expire and new contracts with emissions reporting requirements are put in place, the baseline year Major Suppliers emissions will need to be recalculated in order to remain relevant.
- Changes in calculation methodology, improved accuracy of emissions factors, or improved activity data that result in a significant impact on the baseline year emissions data
- Discovery of significant errors, or cumulative errors, that are collectively significant.

Baseline Emissions Summary

Category (ISO 14064-1:2018)	Scopes (ISO 14064-1:2006)	Emission Source	Baseline (tCO ₂ e)	Emissions data used	Rationale (if not 2018/19)/Notes
Category 1: Direct emissions	Scope 1	Waste to landfill	51210.49	2019/20	Earliest data available using new reporting methodology
		Closed landfills	9684.28	2019/20	Not calculated prior to 2019/20
		Wastewater Treatment	9884.02	2023/24	Earliest data available using new reporting methodology
		Stationary Diesel	752.97	2018/19	
		Stationary LPG	1908.56	2018/19	
		Fleet Fuel – Diesel	327.96	2018/19	
		Fleet Fuel – LPG	0.00	2018/19	
		Fleet Fuel – Petrol	160.36	2018/19	
		Fertiliser	32.90	2018/19	

		Refrigerant Leakage	368.90	2018/19	
		Biomass	8.70	2018/19	Biomass woodchips used in Botanic Gardens propagation facility in 2018/19, however primary use of woodchips in 2024/25 was from Te Puna o Whakaehu, which was not operating in 2018/19.
Category 2: Indirect emissions from imported energy	Scope 2	Electricity	3682.24	2018/19	
Category 3: Indirect emissions from transportation	Scope 3	Air travel	312.07	2018/19	
		Hotel Stays	1.37	2020/21	Earliest data available
		Private cars	21.29	2018/19	
		Rental cars	0.00	2020/21	Earliest data available
		Taxis	2.46	2018/19	
		Staff Travel to Work	518.05	2020/21	Earliest data available
		Staff Working from Home	7.19	2020/21	Earliest data available
Category 4: Indirect emissions from products used by organisation		3 Waters Chemicals	2075.36	2021/22	Earliest data available
		Electricity T&D losses	321.01	2018/19	
		Major Suppliers	5177.47	2021/22	Earliest data available
		Composting (non DCC facility)	0.00	2018/19	No DCC organics collection in baseline year. There was some composting at Green Island Resource Recovery Park, in the form of windrows of diverted green waste. However, DCC do not have data available on this source.
		Wastewater Treatment - sludge disposed at private landfill	0.00	2018/19	No sludge deposited at private landfill in 2018/19 (deposited at DCC's Green Island landfill in 2018/19)
Total			86,457.66		

Appendix 2: Full list of Emissions Reduction Projects

Zero Carbon Plan action #	Description	Timeframe	Lead team within DCC	Support team/s within DCC	Emissions sources targeted
C2.4.3	Implement the Zero Carbon Policy to ensure DCC activities minimise emissions and contribute to the achievement of emissions reduction targets	Ongoing	Zero Carbon		All sources
C2.4.3a	Implement a standardised approach to give effect to the Zero Carbon Policy through project management, including guidance and support for DCC staff and suppliers	2025/26	Zero Carbon		All sources, particularly Major Suppliers
C2.4.3b	Continue to ensure that relevant Council reports set out how options and recommendations give effect to the Zero Carbon Policy.	Ongoing	Zero Carbon		All sources
C4.8.1	Continue to implement a standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers	Ongoing	Procurement		All sources, particularly Major Suppliers, Stationary Energy & Refrigerants
C4.8.1a	Monitor and manage performance against emissions reporting and reduction actions associated with contracted work and services	Ongoing	Across DCC		All sources, particularly Major Suppliers
E1.2.1	Deliver heat recovery system at Moana Pool	2025/26-2026/27	Parks and Recreation Services (PARS)		Stationary LPG
E1.2.4a	Plan and deliver Civic Centre efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2027/28-2028/29	Property		Electricity & Stationary LPG
E1.2.4b	Plan and deliver Dunedin City Library efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2027/28-2028/29	Property		Electricity & Stationary LPG
E1.2.4c	Plan and deliver Dunedin Public Art Gallery efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2028/29-2029/30	Property		Electricity & Stationary LPG
E1.2.4d	Plan and deliver Toitū Otago Settlers Museum efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2026/27-2027/28	Property		Electricity & Stationary LPG

E1.2.4e	Plan and deliver Town Hall and Municipal Chambers efficiency improvements to decarbonise and renew energy systems and infrastructure including HVAC, Lighting, BMS, & Water Heating	2028/29-2029/30	Property		Electricity & Stationary LPG
E1.2.7a	Explore and implement options to displace stationary diesel use and improve energy efficiency at 3 Waters facilities as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters		Stationary Diesel
E1.2.11	Implement preferred option to improve the overall energy efficiency and reduce LPG use at Andersons Bay Crematorium	2025/26-2026/27	PARS		Stationary LPG
E1.2.12	Explore and implement other upgrades to improve energy efficiency and displace stationary diesel and LPG use at other PARS facilities as part of relevant asset management and capital works programmes	Ongoing	PARS		Stationary LPG & Electricity
E3.4.1a	Explore options for renewable energy generation associated with 3 Waters assets, as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters		Electricity, Stationary Diesel, Stationary LPG
E3.4.4	Explore and implement options for renewable energy generation associated with other DCC assets, as part of other energy efficiency and decarbonization work programmes	Ongoing	Property		Electricity
E4.6.1	Continue to reduce the GWP of refrigerants on DCC property, as part of other energy efficiency and decarbonization work programmes	Ongoing	Property		Refrigerants
R1.1.1	Continue to develop and support existing resource recovery parks: Green Island, Waikouaiti, Middlemarch	Ongoing	Waste and Environmental Solutions (WES)		Waste
R1.1.2	Develop a central city location for collection of recyclable materials and sale of diverted items (a 'second Rummage store')	2026/27-2027/28	WES		Waste
R1.1.3	Provide rural recycling hubs	2025/26-2033/34	WES		Waste
R1.1.4	Work with community partners to support three or more communities to establish new community-led resource/recycling centres in local neighbourhoods	2025/26-2027/28	WES		Waste
R1.1.5	Complete business case for a wider network of community-led resource/recycling centres in local neighbourhoods	2025/26	WES		Waste
R1.1.6	Support communities to operate and develop community-led resource/recycling centres into self-sustaining operating models	2023/24-2027/28	WES		Waste
R1.1.7	Work with community partners to progressively expand the network of community-led resource/recycling centres	2023/24-2030/31	WES		Waste

R1.1.8	Continue to support/run and grow a calendar of community events and education to divert household items from landfill, including repair cafes and Para Kore	Ongoing	WES		Waste
R1.2.1	Expand supports for waste minimisation education, projects, facilities, and services to include initiatives that support resource circularity, and to ensure that key services can access multi-year funding.	Ongoing	WES		Waste
R1.2.2a	Progress collaborative work on circular economy with partners	Ongoing	Zero Carbon	WES	Waste
R1.3.1	Construct new Green Island composting facility	2025/26-2026/27	WES		Waste
R1.3.3	Explore options to prevent organics entering DCC owned landfills once alternative disposal solutions are available	2026/27	WES		Waste
R1.3.4	Encourage and support waste-related improvements to regional planning documents, including improved provisions for composting	Ongoing	WES		Waste
R1.4.1	Construct Green Island facility for storing timber diverted from landfill	2025/26-2027/28	WES		Waste
R1.4.2	Continue collaborating with other councils to identify or create solution for timber and other regional waste processing infrastructure	Ongoing	WES		Waste
R1.4.3	Explore with community partners the potential for construction waste re-use hub(s)	2025/2026	WES		Waste
R1.4.4	Support the establishment and operation of construction waste re-use hub(s)	2026/27-2027/28	WES		Waste
R1.4.5	Explore options for incentives to encourage low carbon, circular, low waste design for construction projects	2025/2026	WES		Waste
R1.4.6	Implement incentives for low carbon, circular, low waste design for construction projects	2025/26-2030/31	WES		Waste
R1.4.7	Explore ways to support the establishment and operation of building deconstruction services	2025/2026	WES		Waste
R1.4.8	Support the establishment and operation of building deconstruction services	2025/26-2030/31	WES		Waste
R1.4.9	Deliver a pilot programme for construction waste separation	2025/2026	WES		Waste
R1.4.10	Undertake and publish case studies on separating construction waste and reducing waste in design	2025/2026	WES		Waste

R1.4.11	Publish information about best practice for reducing construction material use and waste through design and construction	2025/2026	WES		Waste
R1.5.1	Continue to expand provision of waste minimisation information and education, including developing an online information hub, a mobile waste education unit and delivering a business education programme	Ongoing	WES		Waste
R1.5.2	Construct new resource recovery park at Green Island to provide infrastructure for waste diversion	2023/24-2026/27	WES		Waste
R1.5.4	Explore how to best support businesses to undertake waste audits and develop waste minimisation plans	Ongoing	WES		Waste
R1.5.5	Support business to undertake waste audits and develop waste minimisation plans	Ongoing	WES		Waste
R1.6.3	Undertake study to determine source of paper sent to landfill	2025/26-2030/31	WES		Waste
R1.6.4	Use findings from R1.6.3 to plan and implement actions to reduce, re-use, or recycle paper	2025/26-2030/31	WES		Waste
R1.6.5	Undertake study to determine source and composition of textiles sent to landfill	2025/26-2030/31	WES		Waste
R1.6.6	Use findings to plan and implement actions to reduce, re-use, or recycle textiles	2025/26-2030/31	WES		Waste
R1.6.7	Ensure all major chemicals used within DCC are included within emissions data, including but not limited to aquatics chlorine use, and liming of sludge at Tahuna WWTP	Ongoing	3 Waters	Zero Carbon	Chemicals
R1.6.8	Identify opportunities to reduce emissions from chemicals use, and implement changes	Ongoing	3 Waters		Chemicals
R1.6.9	Deliver water treatment plant process optimisation to reduce chemical use	2026/27-2032/33	3 Waters		Chemicals
R3.7.1	Complete business case for bioresources facility	2025/26	3 Waters	WES	Waste, Wastewater Treatment, & Stationary Diesel
R3.7.2a	Deliver bioresources facility (Phase 1 - 2000T per annum)	2026/2027-2029/2030	3 Waters		Waste, Wastewater Treatment, & Stationary Diesel
R3.8.2	Purchase and install gas engine at Green Island Landfill	2024/25-2026/27	WES		Waste
R3.8.3	Continue work to optimise gas capture and destruction at Green Island Landfill	Ongoing	WES		Waste
R3.8.4	Deliver a gas flare at Mosgiel Wastewater Treatment Plant	2025/26	3 Waters		Wastewater Treatment

R3.8.5	Undertake monitoring and explore other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes	2025/26-2026/27	3 Waters		Wastewater Treatment
R3.8.6	Implement other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes as part of relevant 3 Waters asset management and capital works programmes	Ongoing	3 Waters		Wastewater Treatment
T3.7.2a	Implement flexible working policy across DCC to enable working from home where appropriate	Ongoing	Across DCC		Staff travel to and from work
T5.15.7a	Explore options to encourage and enable greater uptake of public transport by DCC staff	2025/26	Transport		Staff travel to and from work
T5.15.7b	Implement preferred initiative to support greater uptake of public transport by DCC staff – please note that a decision on this action is deferred until all implications are known, including financial and resourcing	Ongoing from 2026/27	Transport		Staff travel to and from work
T5.15.7e	Investigate options to encourage and enable greater uptake of e-bikes by DCC staff	2025/26	Transport		Staff travel to and from work
T5.15.7f	Implement preferred e-bike option for DCC staff – please note that a decision on this action is deferred until all implications are known, including financial and resourcing	Ongoing from 2025/26	Transport		Staff travel to and from work
T5.15.7g	Review and upgrade as necessary DCC end of trip facilities, such as bike parking	Ongoing	Transport		Staff travel to and from work
T5.15.7h	Promote end of trip facilities for DCC staff	Ongoing	Transport		Staff travel to and from work
T5.15.7i	Produce internal DCC communications and engagement on sustainable travel options and initiatives	Ongoing	Transport		Staff travel to and from work
T5.15.7j	Continue to undertake annual DCC staff travel surveys	Ongoing	Transport		Staff travel to and from work
T5.15.8	Continue to optimise and electrify the DCC fleet as part of asset renewals	Ongoing	Fleet		Fleet
T5.15.9	Implement initiatives to reduce DCC air travel, including managing team travel budgets and encouraging alternatives to travel and/or alternative travel modes, as appropriate	Ongoing	Executive Leadership Team		Business Travel
T7.21.3	Invest in infrastructure to support continued DCC fleet electrification	2024/25-2027/28	Fleet		Fleet

Appendix 3: Detailed DCC Emissions Inventory and 2029/30 Targets

Category (ISO 14064-1:2018)	Scopes (ISO 14064-1:2006)	Emission Source	Baseline (tCO ₂ e)	2023/24 (tCO ₂ e)	2024/25 (tCO ₂ e)	2026/27 (tCO ₂ e)	2029/30 (tCO ₂ e)	% change Baseline to 2029/30
Category 1: Direct emissions	Scope 1	Waste to landfill	51210.49	25267.44	25518.96	24000.00	18352.10	-56.57%
		Composting	0.00	0.00	3012.42	3012.42	3889.60	
		Closed landfill	9684.28	7720.35	7292.85	6567.80	5634.21	-41.82%
		Wastewater Treatment	9884.02	9884.13	9358.41	9358.41	9358.41	-5.32%
		Stationary Diesel	752.97	605.66	592.58	592.58	565.61	-24.88%
		Stationary LPG	1908.56	2700.05	2368.09	1417.17	625.35	-67.23%
		Biomass	8.70	178.85	162.70	162.70	162.70	N/A
		Fleet Fuel - Diesel	327.96	355.05	354.64	334.21	305.72	-6.78%
		Fleet Fuel - Petrol	160.36	77.67	81.44	62.16	35.39	-77.93%
		Fertiliser	32.90	15.67	14.20	11.77	11.77	-64.22%
		Refrigerant Leakage	368.90	253.78	149.43	106.66	100.39	-72.79%
Category 2: Indirect emissions from imported energy	Scope 2	Electricity	3682.24	2577.31	2934.42	2577.31	2401.83	-34.77%
Category 3: Indirect emissions from transportation	Scope 3	Staff Travel to Work	518.05	487.28	579.37	493.20	268.86	-48.10%
		Air travel	312.07	115.00	106.37	87.39	68.32	-78.11%
		Private cars	21.29	23.71	22.51	16.02	16.02	-24.75%
		Staff Working from Home	7.19	1.63	1.24	1.24	1.24	-82.75%
		Taxis	2.46	0.88	0.64	0.64	0.64	-74.00%
		Hotel Stays	1.37	2.42	2.39	2.05	1.72	25.35%
		Rental cars	0.00	0.24	0.97	0.35	0.20	N/A
Category 4: Indirect emissions from products used by organisation	Scope 3	Major Suppliers	5177.47	5098.58	5205.82	4842.74	3791.98	-26.76%
		Water Treatment Plant Chemicals	2075.36	2195.53	1872.62	1872.62	1872.62	-9.77%

		Electricity T&D losses	321.01	196.01	223.17	223.17	182.67	-43.10%
		Waste to landfill (sludge to non-DCC landfill)	0.00	419.00	41.06	41.06	0.00	N/A
Total			86457.66	58176.24	59896.29	55783.69	47647.34	-44.89%
<i>Science-aligned Target Pathway for 46.2% reduction by 2029/30</i>							46,514.22	-46.2%
Additional Reduction Required to meet Science-aligned Target							1,133.12	

Appendix 4: Emissions Reporting by Emissions Source Type

Emissions Source	Methodology
Transport	<p><u>Staff travel to work</u></p> <p>Emissions associated with DCC staff travelling to and from work are calculated based on the results of the annual workplace travel survey. The emissions inventory is calculated taking into account the following information:</p> <ul style="list-style-type: none"> • The method of travel used by a staff member (ie bike, bus, walk, personal vehicle) • If using a personal vehicle (whether car, motorbike, or scooter), what the fuel source is (petrol, diesel, electric) • For those using a car to get to/from work, whether they carpooled, and if so, how many people they carpooled with • How many km a staff member travels to get to/from work • How many days per week a staff member travels to work • What the emissions factor is per km of travel <p><u>Limitations:</u></p> <p>As the survey results do not cover all staff at DCC, with an approximate 60% response rate, the responses are extrapolated out to cover all staff. It is unknown whether those who complete the survey are representative of all DCC staff, however it is likely representation of staff who are primarily field/operations based rather than office based are under-represented due to greater barriers for them to complete the survey.</p> <p><u>Fleet Fuel</u></p> <p>Fleet fuel emissions are calculated based on actual fuel consumption data for fleet vehicles. This is provided by EROAD, who collate data from DCC fleet fuel cards.</p> <p><u>Business Travel</u></p> <p>Air travel emissions are calculated based on flight data provided by DCC's travel agent and Air New Zealand. Emissions are calculated based on the distance of each flight, the number of DCC passengers on board, and the type of travel (ie domestic travel, short haul international, long haul international).</p> <p>Hotel and rental car emissions are calculated based on information from DCC's travel agent. Hotel emissions are calculated based on the total number of hotel nights from DCC staff. Rental car emissions are calculated on a per kilometre travelled basis.</p> <p>Taxi travel emissions are calculated based on the total taxi dollar spend, with this information provided by the DCC Finance team.</p> <p>Private car emissions are calculated based on the total kilometres claimed by DCC staff, with a default emissions factor per kilometre of travel applied to the total distance travelled to calculate emissions.</p>
Stationary energy	<p>Emissions sources include</p> <ul style="list-style-type: none"> • Stationary LPG combustion • Electricity consumption • Stationary Diesel consumption • Biomass <p>Emissions for all these sources are calculated based on the consumption of energy, taken directly from supplier invoices.</p>
Waste, Wastewater and Composting	<p><u>Green Island Landfill</u></p> <p>The methodology used to generate the Unique Emissions Factor for waste deposited at Green Island landfill considers not only the amount of waste deposited in the reporting year, but also</p>

	<p>factors in assumptions regarding historical waste and the amount it is still emitting, and the amount of landfill gas captured and destroyed at the landfill. It is calculated by a third-party provider.</p> <p><u>Wastewater Treatment</u></p> <p>Reporting methodologies for fugitive emissions associated with wastewater treatment plants have been updated in line with the <i>Water NZ Carbon Accounting Guidelines for Wastewater Treatment</i>, improving the accuracy of emissions reported from this source. The DCC have also incorporated real time data from SCADA monitoring tags within wastewater treatment plants to enable more regular emissions reporting from treatment plants.</p> <p><u>Closed landfills</u></p> <p>Emissions from closed landfills are calculated using an IPCC Waste Emissions calculator based on the time and quantity of waste deposited at each closed landfill DCC own that has ongoing waste emissions. These landfills are at North Taieri, Middlemarch, Forrester Park, Sawyers Bay and Waikouaiti.</p> <p><u>Composting</u></p> <p>Composting emissions are generated from organic material collected through weekly kerbside residential collections. As at 2025 this material is shredded at Green Island Resource Recovery Park and trucked to a composting facility in Timaru. During the period of this EMRP a composting facility will be constructed at Green Island to receive organic material, both from the current kerbside collections and also receive commercial collections. The emissions from this source are calculated using the MfE emissions factor for aerobic composting.</p>
Fertiliser	Fertiliser emissions data is calculated directly from PARS staff based on the type and quantity of fertiliser applied each quarter.
Refrigerants	Refrigerant top up type and quantity data is provided by suppliers who top up DCC's refrigerant systems at the end of the financial year.
Major Suppliers	Emissions from DCC suppliers are calculated based on estimated consumption data of various emissions sources (for instance, petrol and diesel used by suppliers' fleet vehicles) used undertaking DCC contracts provided by suppliers. Methodologies used to estimate DCC contract-related emissions vary across contractors.
Chemicals	Emissions from 3 Waters chemicals use are calculated based on the quantities of each chemical used, and the published emissions factor for that particular chemical. DCC also calculate the freight associated with each chemical based on the chemicals' point of origin.

Appendix 5: Emissions Reduction Projects Completed since 2024 EMRP

The table below outlines projects which were included in the EMRP Projects list in the 2024-2030 EMRP that have been completed, and as such are not included in the list of actions for this 2025/26-2029/30 EMRP.

Zero Carbon Plan action #	Project no. in 2024-2030 EMRP	Description	Completed	Emissions sources targeted
R1.3.2	4	Deliver kerbside food/garden organics collection service	2024/25	Waste
R1.5.3	19	Roll out kerbside recycling collection to some rural areas	2023/24	Waste
E1.2.10	53	Explore options to improve the overall energy efficiency and displace stationary LPG use at Andersons Bay Crematorium	2024/25	Stationary LPG
R3.7.3	44	Build Zero Carbon considerations into 3 Waters Integrated System Planning	2024	Wastewater Treatment, Stationary Diesel, & Chemicals

Appendix 6: Removed/Replaced Emissions Reduction Projects Compared with 2024 EMRP

The table below outlines projects which were included in the EMRP Projects list in the 2024-2030 EMRP that have either been removed or replaced in the list of actions for this 2025-2031 EMRP.

Zero Carbon Plan action #	Project no. in 2024-2030 EMRP	Description	Timeframe	Emissions sources targeted	Removed/Replaced	Reason for removal/replacement
E1.2.2	52	Implement changes to displace LPG used for hot water heating at Moana Pool	2024-2030	Stationary LPG	Removed	No funding available for this action in the 9 Year Plan.
E3.4.1	62	Consider opportunities for renewable generation associated with 3 Waters infrastructure as part of 3 Waters Integrated System Planning	2023/24	Electricity & Stationary Diesel	Replaced	Replaced by E3.4.1a
EMRP	59	Upgrading Civic Centre lighting as the first phase of lighting upgrade programme	2023/24	Electricity	Replaced	Replaced by consolidated building by building actions E1.2.4a-e covering BMS upgrades, lighting upgrades, space and water heating upgrades. Regent Theatre and Dunedin Railway Station full outside the current scope of DCC's organisational emissions inventory.
EMRP	60	Upgrading lighting across three other CBD sites: Dunedin Town Hall/Municipal Chambers, Toitū Early Settlers Museum, and City Library	2025	Electricity	Replaced	
EMRP	61	Complete upgrade of building management systems (BMS) within existing DCC facilities and align strategies, plant and equipment to ensure facilities are designed to reduce energy use	2025	Electricity	Replaced	
E1.2.3	49	Develop detailed cases to improve energy efficiency and displace LPG use at - Civic Centre - Dunedin City Library - Dunedin Public Art Gallery - Toitu Otago Settlers Museum - Dunedin Railway Station - Regent Theatre	2023-2027	Stationary LPG	Replaced	

E1.2.4	50	Implement preferred options to improve energy efficiency and displace LPG use at - Civic Centre - Dunedin City Library - Dunedin Public Art Gallery - Toitu Otago Settlers Museum - Dunedin Railway Station - Regent Theatre	2024-2030	Stationary LPG	Replaced	
R3.7.2	11*	Deliver long-term biosolids solution	2025-2030	Stationary Diesel, Waste, Wastewater	Replaced	There is part-funding in the 9YP for Long-term Bioresources (<i>Deliver bioresources facility - Phase 1 2000T per annum</i>).
R3.7.4	45	Implement outcomes of 3 Waters Integrated System Planning	2023/24- 2030/31	Stationary Diesel, Waste, Wastewater	Replaced	Reflected in the EMRP as sub-projects for which funding has been confirmed through the 9YP, e.g. Long-term Bioresources, Water Treatment Plant process optimisation

Appendix 7: Zero Carbon Policy

Purpose

The purpose of the Zero Carbon Policy ('this Policy') is to ensure that the Dunedin City Council's activities minimise emissions and contribute to achieving both city-wide and DCC emissions reduction targets.

This Policy seeks to achieve the purpose by:

- directing the DCC to prioritise gross emissions reductions
- establishing key principles to guide the organisation's emissions management and minimisation practices
- reflecting the DCC's commitment to its guiding principles of sustainability and the Treaty of Waitangi.

Scope

This Policy applies to:

- all employees of the DCC, including temporary employees and independent contractors acting as agents on behalf of the DCC
- any person who is involved in the operation of the DCC, including elected members, volunteers, honorary or unpaid staff
- every business, service, or activity of the DCC, except those functions that are purely procedural, constitute emergency works, or regulatory functions where this policy is not relevant
- where practicable, the DCC's position in relation to others' proposals or activities that are enabled or supported by the DCC and may impact city-wide emissions.

Definitions

'Activity' or 'activities': any business, service or activity undertaken by or for the DCC, except those functions that are purely procedural (see definition below) or constitute emergency works (see definition below), or regulatory functions where this policy is not relevant. This includes but is not limited to infrastructure projects, service provision, strategy, policy and plan development, procurement decisions etc.

'Carbon Credit': Generic term for any carbon emissions trading unit representing one tonne of carbon dioxide equivalent (tCO₂e). Emissions Trading Scheme-approved carbon credits include New Zealand issued units (NZUs) and Assigned Amount Units (NZAAUs). Carbon Credits may be purchased, sold, traded and/or offset against other carbon emitting activities on the carbon market as a means to manage an organisation's carbon footprint.

'Climate change': long-term shifts in temperatures and weather patterns, in particular shifts from the 1800s largely due to human activities increasing atmospheric carbon dioxide through the burning of fossil fuels (like coal, oil and gas).

'City-wide emissions': all emissions apportioned to the Dunedin City geographical area, within the scope of the Global Protocol for Community-Scale Greenhouse Gas Inventories.

'DCC emissions': emissions generated by DCC activities, within the scope of ISO 14064.

'Enabled emissions': emissions produced due to the use of an asset or infrastructure (e.g. emissions from cars that drive on a road).

'End-of-life emissions': emissions associated with the deconstruction/demolition and disposal of an asset or infrastructure.

‘Embodied emissions’: emissions that are required for the extraction, processing, manufacture and delivery of materials, the building process, and demolition and disposal of materials.

‘Emissions’: greenhouse gases emitted into the atmosphere.

‘Emergency works’: activity/ies that are required to be undertaken quickly to meet health and safety or statutory requirements.

‘Greenhouse gas’: any gas that has the property of absorbing infrared radiation (net heat energy) emitted from Earth’s surface and reradiating it back to Earth’s surface, thus contributing to the greenhouse effect emissions. Greenhouse gases include, but are not limited to, methane, carbon dioxide, and nitrous oxide.

‘Inventory’: a formal measure of total emissions, calculated within a specific time period for an organisation activity/ies or geographic boundary, usually reported in tonnes of carbon dioxide equivalent (tCO₂e).

‘Operational emissions’: The emissions generated during the operational or in-use phase of a building or other infrastructure. This includes the use, management, and maintenance of a product or structure.

‘Pre-industrial levels’: the period of 1850-1900, as used by the IPCC Special Report on Global Warming.

‘Procedural functions’: These include (but are not limited to) matters concerning procedures, appointments, remuneration, terms of reference, budgeting and governance.

‘Whole-of-life emissions’: emissions associated with the entire life of an asset. This includes emissions across the full supply chain of construction materials and products, construction processes (and the waste arising), on-going operations, repair and maintenance, and processes at the end-of-life of a building or infrastructure.

Policy

1. Targets

- 1.1. The Dunedin City Council (DCC) is seeking to reduce emissions in a manner that is consistent with limiting global warming to no more than 1.5°C above pre-industrial levels, including by achieving or exceeding adopted city-wide emissions reduction targets and the DCC organisational targets.
- 1.2. In pursuit of targets, the DCC will prioritise gross emissions reduction.

2. Emissions Monitoring and Reporting

- 2.1. The DCC will prepare, and publicly report, a city-wide emissions inventory consistent with the Global Protocol for Community-Scale Greenhouse Gas Inventories and Global Covenant of Mayors requirements.
- 2.2. The DCC will monitor, measure, report, manage, verify and publicly report DCC emissions on a regular basis in line with the requirements of ISO 14064.
- 2.3. To support DCC emissions monitoring, relevant teams will collect data from their operations and include in applicable contracts a requirement to provide emissions data.

3. Approach to emissions reduction

- 3.1. The DCC will ensure appropriate staff resourcing to deliver on this Policy.
- 3.2. The DCC will contribute to achieving emissions reduction targets, including through implementing city-wide emissions reduction plans and DCC emission reduction plans.
- 3.3. The following key principles guide the DCC’s emissions management and minimisation practices:
 - i. **Focus on city-wide emissions early:** the city-wide emissions impact of a proposed asset/activity should be considered and minimised at the pre-initiation or conceptual phase, as well as throughout problem definition and options assessment.

- ii. **Escalate the decision if an increase in city-wide emissions is likely:** a proposed activity/asset identified as likely to increase city-wide emissions should be referred for consideration to a member of the DCC Executive Leadership Team.
- iii. **Prefer options that contribute most to city-wide emissions reduction targets:** options that avoid or minimise city-wide emissions should be identified, considered, and preferred throughout the delivery of an activity. Options that lock in the creation and/or production of emissions should be avoided. City-wide emissions reduction targets should be included in investment objectives and options selection criteria.
- iv. **Minimise whole-of-life emissions:** once an investment decision has been made, identify and implement the overall greatest opportunities for emissions reduction over the activity's lifetime (including reductions in embodied, operational, enabled and end-of-life emissions).
- v. **Minimise exposure to climate change risks:** avoid or minimise investments in assets and services that lock in risks from the impacts of climate change.
- vi. **Clearly report emissions considerations:** Relevant Council reports will set out how options and recommendations give effect to the Zero Carbon Policy.

4. Regulatory Functions

- 4.1. This Policy is to only be considered as part of a regulatory decision where the regulatory framework allows that.

5. Review and Updates

- 5.1. This Policy is subject to on-going review. It will be reviewed at least once every three years, or more frequently as required to ensure it is aligned with statutory obligations and the DCC's strategic objectives.
- 5.2. The DCC will produce and update an associated process document to support the application of this policy.

Appendix 8: Notable Changes in Emissions Modelling – 2024 EMRP vs 2025 EMRP

The table below outlines notable changes between modelled emissions in the 2023/24-2030/31 EMRP (2024 EMRP) and this 2025/26-2029/30 EMRP (2025 EMRP). The 2023/24-2030/31 EMRP modelled emissions to a 2030/31 target year, however this 2025/26-2029/30 EMRP models to a target year of 2029/30 to better align DCC's short term target to a best practice Science Based Target.

Emission Source	2024 EMRP (2030/31 target) tCO2e	2025 EMRP (2029/30 target) tCO2e	Reason for Change in Modelled Emissions
Waste to landfill	26,285	18,352	Modelled landfill gas capture and destruction rates amended to reflect performance up to 2024/25 (better than modelled). Total quantum of waste entering landfill updated - 2024 EMRP modelling was completed prior to the changes to kerbside collection services (including weekly green waste collection, kerbside general waste bins collected fortnightly). 2025 EMRP modelling updated based on quantum of waste collected during 2024/25 with new residential kerbside services. Waste diversion rates in modelling same across 2024 and 2025 modelling. The changes to assumed waste volumes and updated landfill gas capture projections significantly reduce modelled emissions from this source.
Composting	4,308	3,890	Projected composting emissions reduced slightly to reflect the smaller scope of the bioresources facility in 9YP, meaning slightly less material per annum is forecast to be composted compared with 2024 modelling.
Wastewater Treatment	6,438	9,358	Significant change in calculation methodology between 2024 modelling and 2025 modelling.
Stationary Diesel	120	566	2025 modelling retains the sludge incinerator at Tahuna.
Stationary LPG	181	625	The primary change is 2025 modelling retains LPG consumption at Moana Pool.
Biomass	N/A	163	Emissions source added since 2024 EMRP.
Fleet Fuel - Diesel	117	306	Fleet petrol and diesel modelled separately in 2025 modelling. Fleet emissions projected to be higher in 2025 modelling, based on 9YP funding, and also changes in market conditions such as removal of clean car subsidy.
Fleet Fuel - Petrol		35	
Electricity	2,249	2,402	Updated based on electricity emissions trends in 2023 and 2024.
Staff Travel to Work	236	269	2025 modelling updated based on changes in walking/cycling/public transport incentives and funding available.

Water Treatment Plant Chemicals	2,128	1,873	2025 modelling updated to reflect reduction in chemical use and shift to local suppliers within 3 Waters in 2024 and 2025.
Electricity T&D losses	261	183	Updated based on electricity emissions trends in 2023 and 2024.
Total across all emissions sources (including ones not shown above)	51,753	47,647	