GREENHOUSE GAS EMISSIONS INVENTORY AND MANAGEMENT REPORT

Prepared in accordance with ISO 14064-1:2018

Dunedin City Council

Prepared by Zero Carbon - Dunedin City Council
Dated: September 2025

Verification status: McHugh & Shaw Limited completed independent assurance. Assurance level achieved is Reasonable Assurance for ISO Cat 1-2 and Limited Assurance for ISO Cat 3-6.

Measurement period: 01 July 2024 to 30 June 2025
Base year period: 01 July 2018 to 30 June 2019

Approved for release by:

Manager - Zero Carbon

Version date: 16/09/2025

Availability

The report will be published on DCC's website at https://www.dunedin.govt.nz/dunedin-city/climate-change/zero-carbon and reported to the DCC Executive Leadership Team (ELT) and Council.

Report Structure

The Inventory Summary contains a high-level summary of this year's results and has a brief comparison to baseline[1] and 2023/24 inventories.

Chapter 1, the Emissions Inventory Report, includes the inventory details. The inventory is a complete and accurate quantification of the amount of greenhouse gas (GHG) emissions[2] and removals that can be directly attributed to the organisation's operations within the declared boundary and scope for the specified reporting period. The inventory has been prepared in accordance with the requirements of *ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*[3]. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

Chapter 2 covers the DCC's progress against the organisation's Emissions Management and Reduction Plan 2023/24 – 2030/31 (EMRP) and associated targets.

Appendix 1 holds detailed emissions inventory results, including a breakdown of emissions by source and sink, and emissions by greenhouse gas type. Appendix 1 also contains detailed context on the inventory boundaries, inclusions and exclusions, calculation methodology, liabilities, and supplementary results.

Also included as appendices is information on significance criteria, baseline emissions and recalculation policy, and changes in reported emissions since 2023/24.

[1] DCC's baseline generally refers to the 2018/2019 inventory, however, as set out in Appendix 5, later years are used for some emissions sources where appropriate data for 2018/2019 is not available

[2] Throughout this document "emissions" means "GHG emissions".

[3] Throughout this document 'GHG Protocol' means the *GHG Protocol Corporate Accounting and Reporting Standard* and 'ISO 14064-1:2018' means the international standard *Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

Contents

List of Tables

List of Figures

Executive Summary

This is the annual Greenhouse Gas Emissions Inventory and Management Report (IMR) for DCC covering the measurement period 01 July 2024 to 30 June 2025.

The IMR is divided into two chapters. The first chapter provides a summary of emissions inventory results and clarifies the scope of this report.

The second chapter covers emissions inventory results in more detail by drawing on the DCC's Emissions Management and Reduction Plan 2023/24 – 2030/31 (EMRP) and emission reduction targets.

The IMR incorporates a number of new emissions sources, and also reflects an updated baseline year following amendments to the methodology for wastewater treatment plant emissions (biological processes).

Table 1 provides an inventory summary covering the 2024/25 measurement period, compared against 2018/19 and 2023/24. At 59,896.28t$C0_2$e, the DCC's 2024/25 emissions were:

- 2.9% (1,706.37tCO_2e) higher than 2023/24, and
- 30.7% (26,552.67 tCO_2e) lower than baseline.

Table 1: Inventory summary

Category (ISO 14064-1:2018)	Scope (ISO 14064-1:2006)	2018/19	2023/24	2024/25
Category 1: Direct emissions	Scope 1	74,339.14	47,058.90	45,893.30
Category 2: Indirect emissions from imported energy (location-based method*)	Scope 2	3,682.24	2,577.31	2,934.42
Category 3: Indirect emissions from transportation	Scope 3	862.43	631.24	713.49
Category 4: Indirect emissions from products used by organisation		7,573.84	7,922.46	10,355.07
Category 5: Indirect emissions associated with the use of products from the organisation		-	-	-
Category 6: Indirect emissions from other sources		-	-	-
Total direct emissions		**74,339.14**	**47,058.90**	**45,893.30**
Total indirect emissions*		**12,118.52**	**11,131.01**	**14,002.98**
Total gross emissions*		**86,457.66**	**58,189.91**	**59,896.28**
Category 1 direct removals		-	-	-
Purchased emission reductions		-	-	-
Total net emissions		**86,457.66**	**58,189.91**	**59,896.28**

*Emissions are reported using a location-based methodology.

Figure 1 shows the EMRP baseline, and actual DCC emissions over the period 2022/23 to 2024/25 (orange), along with the DCC's emissions reduction targets for 2026/27 and 2030/31 (grey).

The DCC's 2024/25 result is:

- 624.08tCO2e below the DCC's 2026/27 target of a 30% reduction from baseline
- 9,750.84tC02e above the DCC's 2030/31 target of a 42% reduction from baseline.

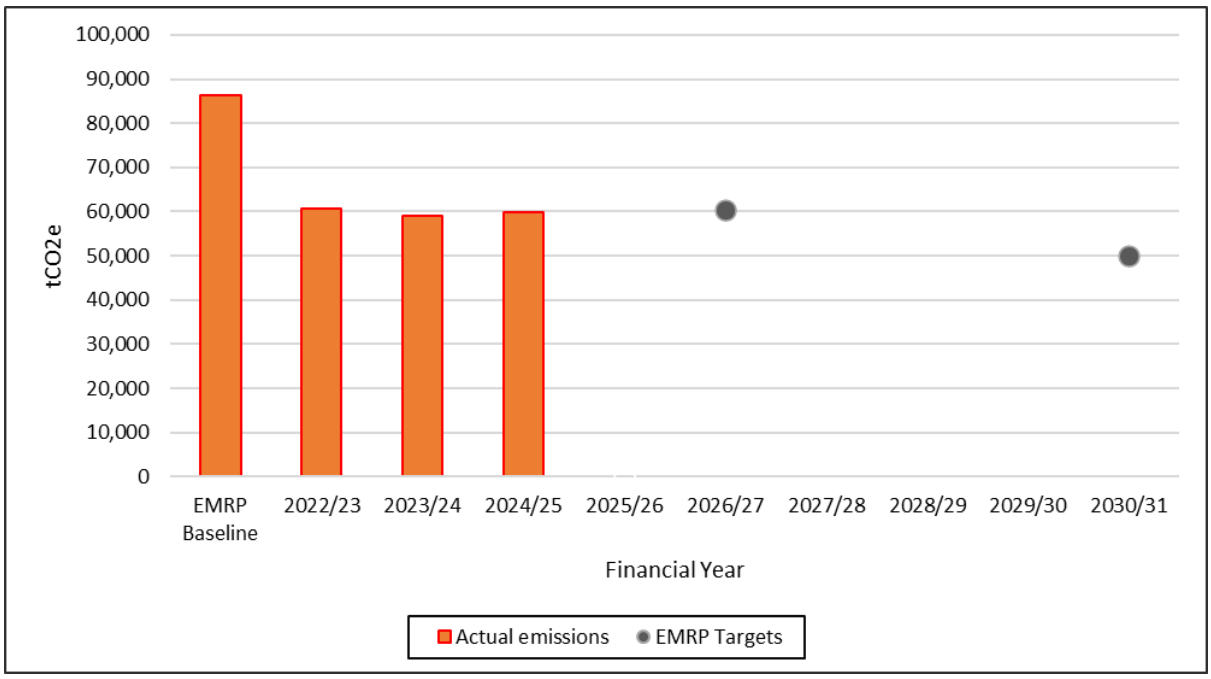

Figure 1: DCC EMRP baseline emissions, actual DCC emissions for 2022/23-24/25, and EMRP targets

Chapter 1: Emissions Inventory Report

1.1 Introduction

The purpose of this IMR is to quantify emissions that can be attributed to DCC's operations within the declared boundary and scope for the July 2024 to June 2025 period. This inventory is aligned with best practice for emissions measurement and reporting and is part of an ongoing commitment to measure and reduce emissions on a regular basis.

The inventory report and any assertions are expected to be verified by a third-party verifier. The level of assurance is reported in a separate Assurance Statement, and is summarised on the title page of this IMR.

1.2 Emissions Inventory Results

The following tables and figures provide an overview of the DCC's emissions for 2024/25:

- Table 2 shows emissions by category for 2024/25, as well as emissions intensity based on residents, rateable properties and operating revenue.
- Figure 2 shows emissions by category.

- Table 3 breaks down emissions further to the emissions source and compares the 2024/25 figures to the baseline year 2018/19 and 2023/24.
- Figure 3 shows emissions by business unit within DCC, with Figure 4 showing emissions by source for 2024/25.

Table 2: Emissions inventory summary for this measurement period

Measurement period: 01 July 2024 to 30 June 2025

Category	**Total emissions (tCO_2e)**
Category 1: Direct emissions	45,893.30
Category 2: Indirect emissions from imported energy (location-based method*)	2,934.42
Category 3: Indirect emissions from transportation	713.49
Category 4: Indirect emissions from products used by organisation	10,355.07
Category 5: Indirect emissions associated with the use of products from the organisation	-
Category 6: Indirect emissions from other sources	-
Total direct emissions	**45,893.30**
Total indirect emissions	**14,002.98**
Total gross emissions	**59,896.28**
Category 1 direct removals	-
Purchased emission reductions	-
Total net emissions	**59,896.28**
Emissions intensity	**Total emissions (tCO2e)**
Rateable properties (gross tCO2e / unit)	1.07
Residents (gross tCO2e / unit)	0.44
Operating revenue (gross tCO2e / $Millions)	93.58

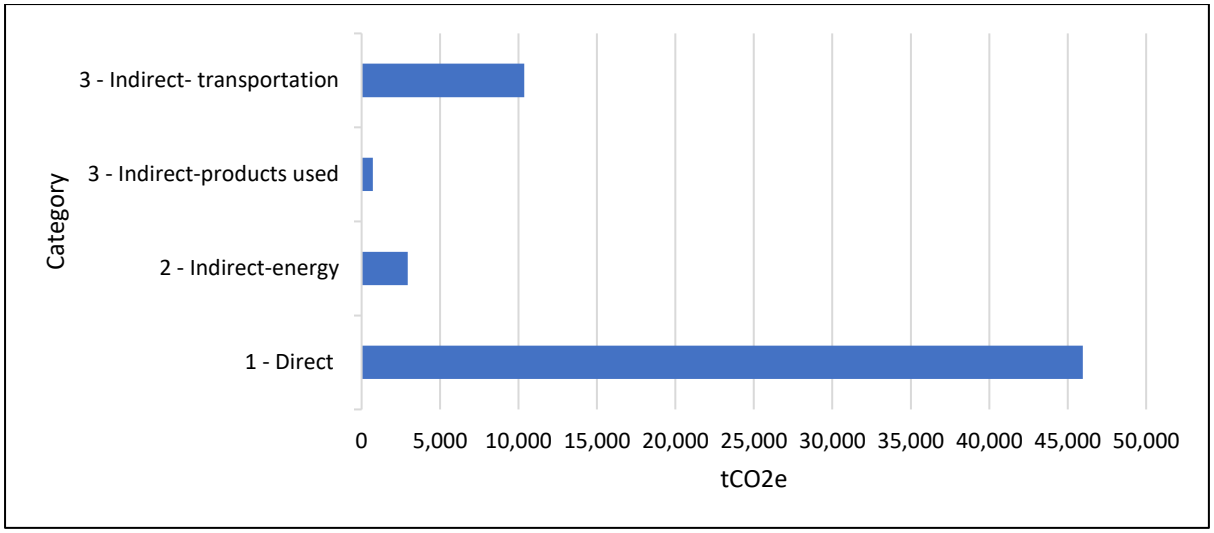

Figure 2: Emissions (tCO_2e) by category in 2024/25

Table 3 compares the 2024/25 inventory with the 2018/19 base year inventory, and the 2023/24 inventory.

Table 3: Comparison of historical emissions inventories

Category (ISO 14064-1:2018)	Scope (ISO 14064-1:2006)	2018/19	2023/24	2024/25
Category 1: Direct emissions	Scope 1	74,339.14	47,058.90	45,893.30
Category 2: Indirect emissions from imported energy (location-based method*)	Scope 2	3,682.24	2,577.31	2,934.42
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Category 5: Indirect emissions associated with the use of products from the organisation		-	-	-
Category 6: Indirect emissions from other sources		-	-	-

Total direct emissions		**74,339.14**	**47,058.90**	**45,893.30**
Total indirect emissions*		**12,118.52**	**11,131.01**	**14,002.98**
Total gross emissions*		**86,457.66**	**58,189.91**	**59,896.28**
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Purchased emission reductions		-	-	-
Total net emissions		**86,457.66**	**58,189.91**	**59,896.28**

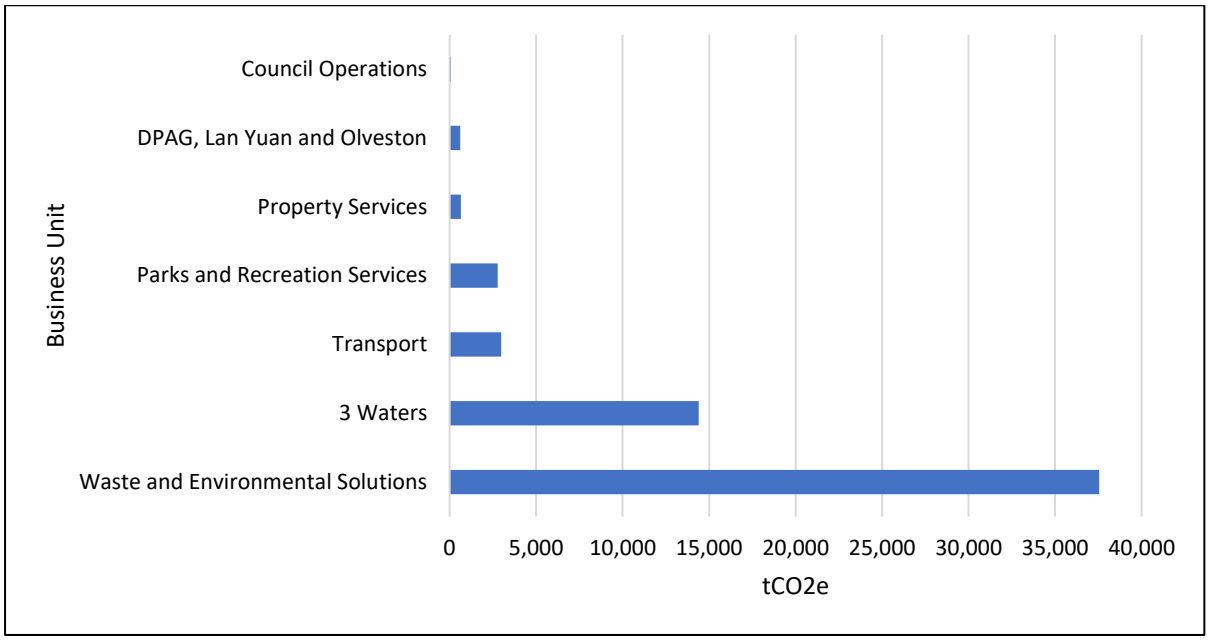


Figure 3: Emissions (tCO_2e) by business unit in 2024/25

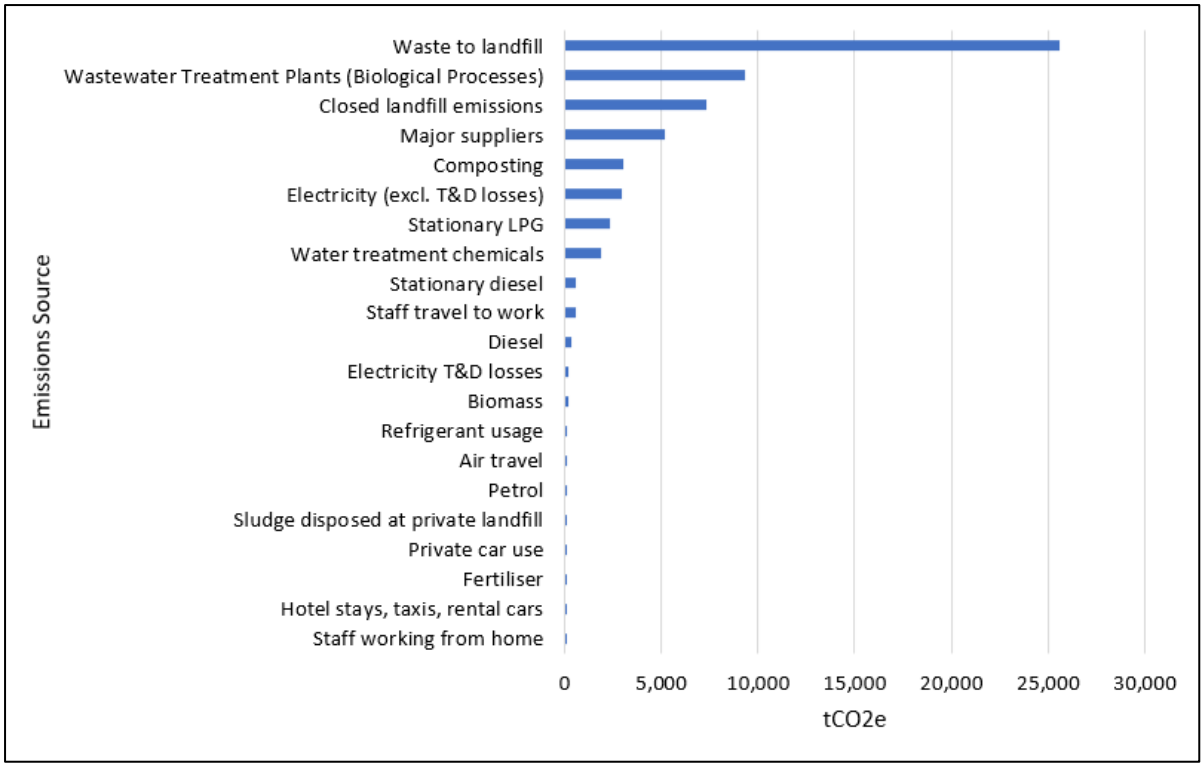


Figure 4: Emissions (tCO_2e) by source in 2024/25

1.3 Organisational Context

1.3.1 Organisation Description

DCC is the local authority of the residents and ratepayers of Dunedin. The activities undertaken by the DCC include water supply; wastewater collection and treatment; storm water management; solid waste management; provision of transportation infrastructure and street lighting; arts and cultural facilities including libraries, museums, and a public art gallery; parks, recreation, and aquatic facilities; and the provision of regulatory, community and economic development services.

Further information about the DCC's activities, including Annual and Long Term Plans, is located at www.dunedin.govt.nz.

Commitment to reducing emissions

The DCC began measuring and reporting its emissions in 2013 and has continued to do so on an annual basis. Since then, various emissions reduction actions have been implemented to reduce the DCC's emissions.

In 2019, Council declared a climate emergency and set emissions reduction goals for Dunedin city:

- net zero emissions of all greenhouse gases other than biogenic methane by 2030
- 24% to 47% reduction below 2017 biogenic methane emissions by 2050, including a 10% reduction below 2017 biogenic methane emissions by 2030.

In June 2022, Council adopted a Zero Carbon Policy, with the stated purpose of ensuring that the DCC's activities "minimise emissions and contribute to achieving both city-wide and DCC emissions reduction targets", including by "implementing city-wide emissions reduction plans and DCC emission reduction plans".

The Zero Carbon Policy specifies that the DCC will seek to achieve or exceed adopted city and DCC organisational emissions reduction targets and directs the organisation to prioritise gross emissions reduction.

The Policy also directs that the DCC will monitor, measure, report, manage, verify and publicly report DCC emissions on a regular basis, in accordance with the requirements set out in ISO14064:2018.

In September 2023, Council adopted the Zero Carbon Plan setting out the actions required for Dunedin city to meet the net zero emissions (excluding biogenic methane) target.

In June 2024, the Executive Leadership Team (ELT) adopted the current Emissions Management and Reduction Plan 2023/24 to 2030/31 (EMRP). This plan sets out DCC's intended approach to reducing emissions over the period 2023/24 to 2030/31.

The DCC's own emissions are significant at the city scale. As of 2021/22, emissions from open and closed landfills and wastewater treatment, which were responsible for more than three quarters of the DCC's emissions in 2021/22, also constitute approximately six percent of Dunedin city's emissions[4].

Addressing the DCC's emissions is therefore an important contribution to city-wide emissions reduction efforts. DCC leadership in achieving emissions reductions is also important to facilitate city-wide emissions reductions with credibility.

Emissions reporting

The DCC produces this inventory annually to assess and transparently report on progress towards organisational emissions reduction targets. Making progress on organisational emissions also constitutes part of DCC's contribution towards Dunedin's target.

1.3.2 Statement of Intent

This inventory forms part of the organisation's commitment to measure and manage down emissions.

Intended use and users

The essential intended use of the inventory is to ensure compliance with the requirements of the ISO-14064:2018 emissions reporting standard, and to accurately measure changes in DCC's emissions, including progress towards its emissions reduction targets.

The DCC is committed to making its verified emissions inventory publicly accessible on the DCC website. In that sense the report is intended for DCC councillors, staff and suppliers,

[4] The city's waste/wastewater emissions also include some emissions not within DCC's organisational inventory, such as residential wastewater septic systems, waste deposited at private landfills, and non-DCC closed landfills.

Dunedin residents, the Local Government Funding Agency and other parties across Aotearoa New Zealand interested in DCC's efforts to manage down emissions.

1.3.3 Person Responsible

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 oversight, management, and coordination of the wider Zero Carbon work programme.

Executive management involvement

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.

As of 30 June 2025, the Zero Carbon Programme Steering Group comprised the Chief Executive, the General Manager Climate & City Growth, and the General Manager Corporate Services. The group was established to lead, direct and enable the programme, including the implementation of the EMRP.

Executive management and governance commitment

As evidenced by adoption of the EMRP, and executive involvement in work programme oversight, the DCC's ELT is committed to implementing the emissions reduction actions listed in Chapter 2.

As set out above, the elected Council has set city targets for emissions reduction. Council commitments to reducing both city and DCC emissions, are embedded in the DCC's strategic and policy framework and have been reaffirmed by a number of Council resolutions in recent years.

Most notable amongst these commitments were the following:

- In 2013, started annual measurement and reporting of DCC emissions
- In 2015, joining the Global Covenant of Mayors for Climate and Energy
- In 2017, adoption of a Carbon Management Policy for the DCC.
- In 2019, declaration of a climate emergency and adoption of the Dunedin's current emissions reduction target
- In 2019, establishment of a dedicated, specifically funded work programme to meet climate change mitigation planning needs (the 'Zero Carbon work programme').
- In 2021, resolving to establish a Zero Carbon Alliance for the city, to support the city's major institutions to achieve emissions reduction.
- In 2022, replacing the Carbon Management Policy with a Zero Carbon Policy, to ensure that the DCC's activities minimise emissions and contribute to achieving both Dunedin and DCC emissions reduction targets.
- In 2023, adopting the Zero Carbon Plan, which sets out the actions required for Dunedin to achieve its target.

- In 2025, resolving to include provision in the 9 year plan 2025 - 34 for a wide range of projects and initiatives that will reduce emissions, both at the Dunedin and DCC scale.

1.3.4 Reporting Period

Base year measurement period: 01 July 2018 to 30 June 2019

The DCC's base year is July 2018 to June 2019. The EMRP uses the same base year.

The DCC used 2013/14 as its baseline year until 2022/23, when it was updated to 2018/19. The change was made to reflect both the significant increases in the scope of DCC's organisational inventory, and the changes in the methodologies used to calculate emissions in recent years.

The emissions baseline has been updated predominantly using 2018/19 data, however, for some emissions sources the reporting methodology has changed, or data from 2018/19 is unavailable due to the emissions source being recently added to the inventory. Where data is unavailable for 2018/19, the earliest data available has been used.

A detailed breakdown of the DCC's baseline is attached as Appendix 5, which notes emissions sources where data other than 2018/19 is used. The DCC's base year recalculation policy is also included in Appendix 5, as is a detailed explanation of changes in DCC baseline since 2023/24 Inventory Management Report.

Measurement period of this report: 01 July 2024 to 30 June 2025

DCC inventory reporting is conducted annually and aligned with the financial year of 1 July to 30 June. This allows DCC to readily compare emissions reporting with financial measures.

1.3.5 Operational control consolidation approach

An operational control consolidation approach was used to account for emissions.

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards.

Justification of consolidation approach

The operational control consolidation approach is the best fit for the DCC. We account for the emissions from operations we control, including indirect emissions from major suppliers of services such as rubbish/recycling collection or roading maintenance in this 2024/25 inventory. We do not account for emissions from operations in which we have a financial interest but have no control.

Organisational structure

Figure 5 shows what has been included within the organisational boundary, in the context of the overall structure.

The organisational chart outlines the core DCC departments as well as council-controlled organisations. The blue boxes indicate departments that have been included in the emissions inventory, while the green boxes indicate exclusions.

The chart excludes non-trading companies for which either the DCC or DCHL holds shareholdings (Tourism Dunedin Ltd, Dunedin Visitor Centre Ltd, Otago Power Ltd, Lakes Contract Services Ltd).

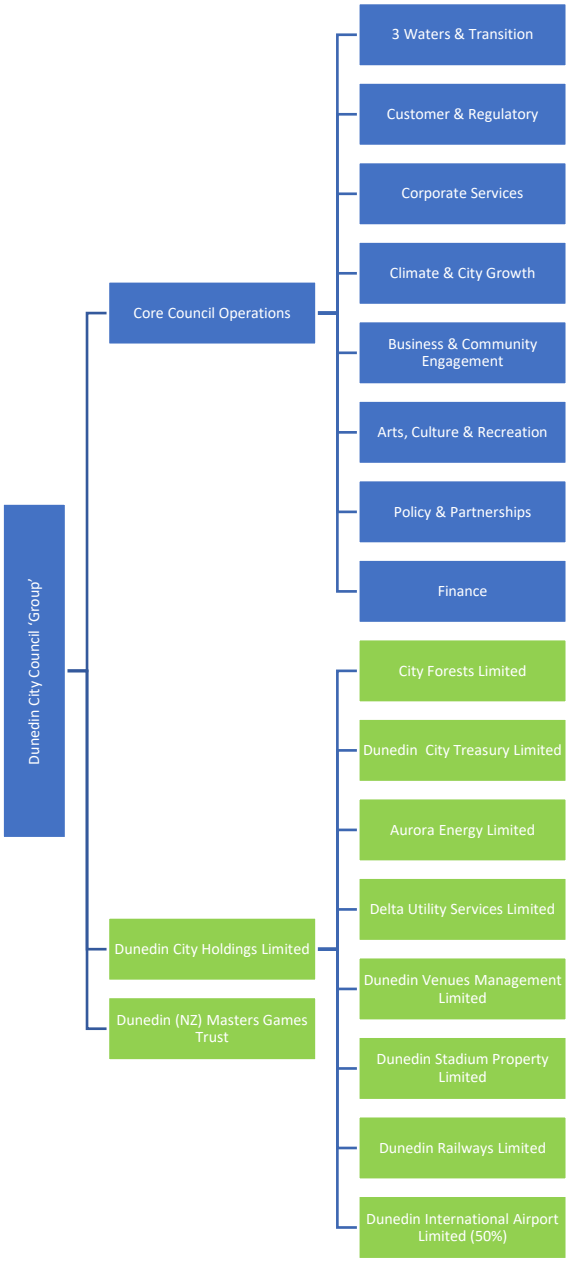
The chart also excludes a number of companies the DCC holds shares in. These include Golden Block Investments Limited (49%), New Zealand Centre of Digital Excellence (49%), Upstart Incubation Trustee Company (33%) and Civic Financial Services Limited (4.19%). The DCC has concluded that the DCC does not have operational control in these companies. While DCC is in a position to exercise significant influence in some, it does not have a majority shareholding in any.

For clarity, while they are shown as outside of DCC's footprint in Figure 5, the portion of Delta Utility Services Limited's emissions related to Parks and Recreation Services activity (undertaken on DCC's behalf) has been included as indirect Category 4 emissions in this inventory.

For the purposes of the 2024/25 emissions inventory, the DCC's emissions are reported at an organisational level.

The DCC is based at the Civic Centre, 50 The Octagon, Dunedin. However, many sites throughout the city are associated with the DCC.

Table 4 provides an overview of each department within DCC, and their functions. Please note that each department hosts a number of business units (such as those reported in Figure 2).



Key: Blue denotes inventory inclusions; green denotes exclusions

Figure 5: Organisational structure

Table 4: Brief description of departments, teams and sites in this emissions inventory

Departments	Teams	Key services/facilities provided
3 Waters & Transition	3 Waters, City Development	Water production and supply, wastewater treatment and stormwater management, city planning, resource management.
Customer and Regulatory Services	Building Services, Resource Consents, Compliance Solutions, Customer Services, i-Site Visitors Centre	Customer and regulatory services including customer services agency, building control, environmental health, and compliance.

Departments	Teams	Key services/facilities provided
Corporate Services	People and Capability, Business Information Services, Quality Improvement, Risk and Internal Audit, Procurement and Contracts, Portfolio and Project Support Office, Health and Safety, Property Services, Legal Counsel.	HR and IT, contract management, project management, health and safety, and property services including parking operations.
Climate and City Growth	Transport, Waste and Environmental Solutions, Zero Carbon, South Dunedin Future	Provision of rubbish and recycling services, waste minimisation education, implementation of Waste Minimisation and Management Plan, roading network, climate change mitigation and adaptation.
Business and Community Engagement	Enterprise Dunedin, Communications and City Marketing, Events, Governance, Corporate Planner	City wide economic development strategy and support, city events and oversight.
Arts, Culture and Recreation	Dunedin Public Library, Mosgiel Library, Other Community Libraries, Dunedin Public Art Gallery, Toitū Otago Settlers Museum, Lan Yuan Chinese Gardens, Olveston, Parks and Recreation Services, City of Literature, Creative Partnerships	Dunedin Public Libraries, Olveston Historic Home, Dunedin Public Art Gallery, Toitū Otago Settlers Museum, and Lan Yuan Chinese Gardens, Botanic Gardens, Parks and Reserves, Cemeteries, and Swimming Pools.
Policy and Partnerships	Māori Partnerships, Māori Cultural Capability, Community Partnerships, Corporate Policy, Policy Advisor Housing, Taskforce Green, Community Development	Council wide strategy, embedding working in partnership with mana whenua across the organisation.
Finance Group	Finance Team	Financial services.
Council Operations	All emissions that cannot easily be reported at a level other than organisation-wide, such as staff commuting, pool fleet vehicles fuel use, councillors and executive leadership travel.	Councillor support, executive functions.

1.3.6 Exclusions

Dunedin City Holdings Limited and its subsidiaries and DCC investment properties and companies were excluded from this inventory as they are not directly managed by the DCC and do not deliver core DCC functions.

This includes non-trading companies for which either the DCC or DCHL holds shareholdings (Tourism Dunedin Ltd, Dunedin Visitor Centre Ltd, Otago Power Ltd, Lakes Contract Services Ltd), and companies the DCC holds shares (Golden Block Investments Limited (49%), New Zealand Centre of Digital Excellence (49%), Upstart Incubation Trustee Company (33%) and Civic Financial Services Limited (4.19%)).

The exclusion of all of these entities is being reviewed for alignment with evolving best practice as part of the DCC's 2025 update of its EMRP.

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.

Cloud-based IT services, some smaller civil and building construction contractors, and other smaller suppliers such as providers of office supplies have not been included in this inventory.

Chapter 2: Emissions Management and Reduction Report

2.1 Emissions Reduction Results

Table 5 provides a summary of the 24/25 inventory by emissions source, and compares with 2023/24, as well as baseline.

Table 5: Emissions inventory by emissions source (tCO2e)

Category (ISO 14064-1:2018)	Scopes (ISO 14064-1:2006)	Emission Source	2018/2019	2023/2024	2024/2025
Category 1: Direct emissions	Scope 1	Waste to landfill	51,210.49	25,267.70	25,518.96
		Closed landfills	9,684.28	7,720.35	7,292.85
		Wastewater treatment emissions	9,884.02	9,884.12	9,358.40
		Stationary LPG	1,908.56	2,700.05	2,368.09
		Diesel stationary energy	752.97	605.66	592.59
		Refrigerant usage	368.90	253.78	149.43
		Fleet fuel - diesel	327.96	355.05	354.64
		Fleet fuel - petrol	160.36	77.67	81.44
		Fertiliser	32.90	15.67	14.20
		Fleet fuel - LPG	-	-	-
		Biomass	8.70	178.85	162.70
Category 2: Indirect emissions from imported energy	Scope 2	Electricity	3,682.24	2,577.31	2,934.42
Category 3: Indirect emissions from transportation	Scope 3	Staff travel to work	518.05	486.99	579.37
		Air travel (combined)	312.07	115.37	106.37

		Private cars	21.29	23.71	22.51
		Staff working from home	7.19	1.63	1.24
		Taxis	2.46	0.88	0.64
		Hotel stays	1.37	2.42	2.39
		Rental cars	-	0.24	0.97
Category 4: Indirect emissions from products used by organisation		Major suppliers	5,177.47	5,111.92	5,205.82
		Water treatment chemicals	2,075.36	2,195.53	1,872.62
		Composting (non DCC facility)	-	-	3,012.40
		Electricity T&D losses	321.01	196.01	223.17
		Wastewater treatment – sludge disposed at private landfill	-	419.00	41.06

2.2 Significant Sources

Waste to landfill

43% of DCC's emissions in 2024/25
(down 50% since 2018/19)

Waste to landfill continues to be the DCC's largest source of emissions, however there have been significant reductions from this emissions source - from 51,211 tCO2e in baseline year to 25,519 tCO2e in 2024/25. The reduction in emissions that has been achieved over this time is primarily due to improvements in the landfill gas capture and destruction.

In 2024/25 there was a slight increase in both the quantity of waste landfilled, and the emissions from waste to landfill compared to 2023/24. This result coincides with two key changes to DCC's kerbside collection services that came into effect in 2024/25. The changes were made to increase the overall rate of diversion of waste (particularly organics) from all landfills. More residual waste entering the DCC-owned Green Island landfill was a predicted side-effect of the change. While the side-effect was anticipated, data limitations make it difficult to state with complete certainty that the increase is due to kerbside changes alone.

A new gas flare was installed at Green Island landfill in January 2025. The flare is certified to destroy (burn) more landfill gas than the previous gas flare, which has the effect of lowering

emissions per tonne of waste. As the landfill-associated unique emissions factor (UEF[5]) is only calculated after the completion of each calendar year, the reduction in 24/25 emissions associated with this change will be reflected in the IMR 2025/26.

Wastewater Treatment Emissions

16% of DCC's emissions in 2024/25
(down 5% since 2023/24)

Wastewater treatment plant (WWTP) emissions are the second largest source of DCC emissions in 2024/25, behind waste to landfill emissions. The emissions for 2024/25 are calculated using both time series data taken from SCADA ID tags monitoring aspects of plant operation such as wastewater flows within WWTPs, as well as lab test data for the three largest WWTPs (Green Island, Mosgiel, Tahuna).

2023/24 was the first year where WWTP emissions were reported using time series data throughout the financial year at Tahuna, Mosgiel and Green Island WWTPs. This led to a significant increase in the calculated emissions for Green Island, Mosgiel, and Tahuna WWTPs relative to the method used in previous financial years. DCC's 3 Waters team confirmed there has been no significant change in wastewater treatment processes had occurred across these three sites between 2019/20 and 2023/24. As such, 2023/24 has been adopted as the new baseline going forward, to enable direct comparison of emissions over time using the same methodology.

Emissions from the four smaller WWTPs (Middlemarch, Warrington, Seacliff, Waikouaiti) are calculated using population estimates, with these estimates unchanged between 2023/24 and 2024/25.

Major Suppliers

9% of DCC's emissions in 2024/25
(up 1% since 2021/22)

The DCC have been reporting major supplier emissions since 2021/22, with the emissions from this source relatively similar over the 2021/22 to 2023/24 period (5,177 tCO2e in 2021/22, compared with 5,111 tCO2e in 2023/24). Emissions in 2024/25 increased slightly to 5,205 tCO2e.

The most significant supplier emissions stem from services where heavy machinery/vehicles are required, including roading construction/maintenance, landfill management, and refuse/recycling collection. As discussed in section 1.3.6, the DCC continues to expand the number of contractors reported in the emissions inventory.

Electricity

5% of DCC's emissions in 2024/25
(down 20% since 2018/19)

[5] Tonkin and Taylor (2025): UEF Application 2024 – Green Island Landfill.

Emissions from stationary electricity have reduced 20% in 2024/25 compared with the baseline year (up 14% compared with 2023/24). The increase since 2023/24 is primarily due to a smaller share of renewable electricity generation in the national grid that increased the emissions per kWh (the relative share of renewable electricity generation decreased from 88%[6] in 2023/24 to 88.5%[7] in 2024/25) imported compared to 2023/24. To a lesser extent, a slight increase in overall electricity consumption (0.32%) also contributed to this development.

Stationary LPG

4% of DCC's emissions in 2024/25
(up 24% since 2018/19)

Stationary LPG emissions are 24% higher in 2024/25 compared to the baseline year. This is primarily due to Moana Pool LPG consumption being significantly higher than in the baseline year (1,347tCO2e from Moana Pool LPG in 2024/25 compared with 985tCO2e in 2018/19).

While stationary LPG emissions are significantly higher than in the baseline year, they are down 12% compared with 2023/24. The is primarily due to the heat recovery system at Moana Pool having been offline for part of 2023/24, but operational for all of 2024/25. Stationary LPG consumption was 17% reduction at Moana Pool during 2024/25.

Water treatment chemicals

3% of DCC's emissions in 2024/25
(down 10% since 2021/22)

Further reductions in emissions associated with water treatment chemicals were achieved in 2024/25, with emissions 15% lower than in 2023/14 (1,872.62tCO2e in 2024/25 compared with 2,195.53tCO2e in 2023/24). Given the regulatory and public health requirements to treat drinking water to safe standards, there are anticipated limits on the extent to which emissions from this source can be mitigated or reduced. However, whenever possible the DCC is procuring chemicals locally.

Stationary diesel

1% of DCC's emissions in 2024/25
(down 21% since 2018/19)

Emissions from stationary diesel decreased by 2% in 2024/25 compared with 2023/24 and are 21% lower than in the 2018/19 baseline year.

Sludge incineration at Tahuna WWTP causes the majority of the DCC's stationary diesel consumption. Partway through 2023/24 maintenance on the Tahuna WWTP incinerator was carried out and several issues fixed, as well as an ash classifier being installed to reduce the amount of ash accumulation in the incinerator. This optimization led to more sludge and less diesel being burned, which saw a significant reduction in the total amount of diesel used at Tahuna WWTP. This reduction has continued through 2024/25, with emissions from Tahuna

[6] MBIE (2024): Energy in New Zealand 2024.
[7] MBIE (2025): Energy in New Zealand 2025.

WWTP stationary diesel combustion down 13% in 2024/25 compared with 2023/24 (472.4tCO2e in 2024/25 compared with 543.73tCO2e in 2023/24).

Stationary diesel use at other sites is largely required during periods of high rainfall when additional pumping is required. While there was a significant flooding event in October 2024, across the whole financial year the amount of stationary diesel required due to wet weather events was similar to previous years.

Influence over activities

The DCC has considerable influence over stationary energy (electricity, diesel, LPG) given the organisation owns the facilities and assets involved. There are several existing actions underway or being investigated to address emissions from these sources, covered in more detail under section 2.4 of this report. Similarly, waste-to-landfill and wastewater emissions are significant sources within DCC's direct influence as the owner and manager of receiving facilities. Projects outlined in section 2.4 aim to reduce these emissions over time.

In 2023, the DCC launched its Procurement Emission Standards, which transparently communicate emissions-related expectations to potential suppliers. There is now a clear expectation that relevant contracts with high likelihood of generating significant emissions are added to reporting, with emissions reduction targets included in contracts where appropriate.

Significant sources that cannot be influenced

Many of the closed landfill sites managed by DCC have not received waste for a considerable period. As such, mitigating the methane emissions from these sites through initiatives such as installing landfill gas capture and flaring infrastructure would not be viable. The emissions from these closed landfills sites will continue to decrease over time, as the organic material deposited decays.

2.3 Emissions Reduction Targets and Tracking

The DCC's EMRP 2023/24-30/31 includes emissions reduction targets through to 2030/31 (timed to align with targets in the city-wide Zero Carbon Plan). There is a high degree of integration and overlap between the EMRP and the Zero Carbon Plan.

Under the Zero Carbon Policy, the DCC's emissions reduction approach is to align targets with endeavours to limit global warming to 1.5°C above pre-industrial levels. The Science-based Targets Initiative provides guidance on how to set targets in line with what climate science deems necessary to avoid catastrophic climate change and reach net-zero by 2050 at latest. In setting the 2030/31 target, the DCC considered the Science-based Targets Initiative guidance on the level of emissions reduction consistent with efforts to keep global warming below 1.5ºC above pre-industrial levels. However, the DCC has not sought accreditation from the Science-based Targets Initiative for its organisational emissions reduction efforts.

The DCC is reviewing its EMRP and targets to reflect the DCC's 9 Year Plan 2025-2034 and the DCC's updated emissions inventory and baseline, as well as evolving best practice. The refreshed EMRP 2025/26-30/31 will include updated targets, and future reporting will be against these.

Table 6 provides details of the organisational emission reduction targets included in the DCC's EMRP 2023/24-30/31, and progress against these.

The DCC's 2024/25 result is:

- 540.5tCO2e below the DCC's 2026/27 target of a 30% reduction from baseline
- 9,833.38tC02e above the DCC's 2030/31 target of a 42% reduction from baseline.

Table 6: DCC organisation emissions targets and tracking

Scope of target	Target (Relative to baseline)	2018/19 Baseline (tCO_2e)	2024/25 (tCO_2e)	Tracking 2024/25 relative to baseline (% change)	Responsibility
All DCC emissions	30% reduction in annual tCO2e emissions by 2026/27	86,457.66	59,896.28	-30.72%	Executive Leadership Team
All DCC emissions	42% reduction in annual tCO2e emissions by 2030/31	86,457.66	59,896.28	-30.72%	Executive Leadership Team

Figure 6 shows the EMRP baseline, and actual DCC emissions over the period 2022/23 to 2024/25, along with the DCC's emissions reduction targets for 2026/27 and 2030/31 (grey).

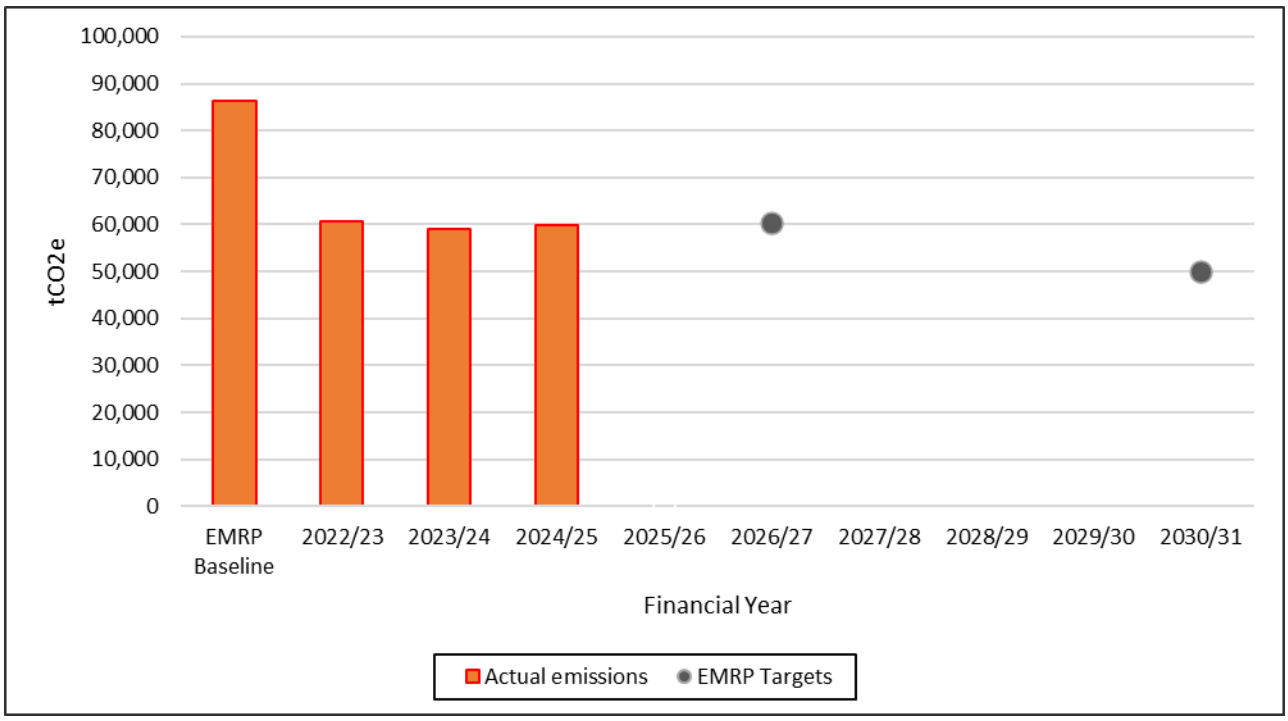


Figure 6: DCC EMRP baseline emissions, actual DCC emissions for 2022/23-24/25, and EMRP targets

2.4 Detailed Tracking of Emissions Sources and Reduction Projects

The sections below provide detailed tracking of emissions sources across DCC, as well as EMRP projects to address these emissions. Emissions sources are ordered from the largest to the smallest, rather than by emissions category.

These sections reference 2030/31 targets for each emissions source based on the DCC's EMRP 2023/24-30/31, approved in June 2024. Progress is also assessed against the delivery timeframes anticipated at the point that the EMRP was adopted.

The review of the EMRP currently underway includes updating the emissions modelling for each emissions source to reflect the projects and delivery timeframes confirmed in the 9 year plan. In many cases these differ from those in the current EMRP. The refreshed EMRP 2025/26-2030/31 will include updated targets for each emissions source, and future reporting will be against the projects and delivery timeframes provided for by the 9 year plan.

2.4.1 Waste

Background

Waste makes up most of the DCC's emissions inventory, accounting for **60% of emissions in the 2024/25 financial year** (42.6% from waste to Green Island landfill, 12.1% from closed landfills and 5% associated with composting).

Waste to Green Island landfill includes waste deposited by community and businesses, and from kerbside collections. It is included in the DCC's inventory because the DCC is the owner and operator of the landfill. Methane emissions are generated from landfilled waste as organic materials decay trapped underneath inorganic materials such as building rubble or plastics.

Tracking against EMRP targets

Table 7 below provides a detailed overview of EMRP targets for the waste emissions category, an overview of emissions for the baseline and last financial year, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Waste to landfill and composting emissions were below the 2030/31 target. Emissions from closed landfills were above the 2030/31 target, however the closed landfills target will only be met in 2030/31 based on the gradual decomposition of historically deposited waste at the closed DCC landfill sites. **Overall, waste emissions in 2024/25 were 184.06tCO_2e below the 2030/31 EMRP target.**

Table 7: Waste emissions overview

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Green Island Landfill	51,210.49	*26,285.64*	25,881.21	25,518.96	**2,061.98 under target (target exceeded)**
Composting	0.00	*4,307.70*	0.00	3,012.40	
Closed landfills	9,684.28	*5,493.12*	7,720.35	7,292.85	**1,799.73 above target (target not yet achieved)**
Total	**60,894.77**	***36,085.76***	**38,742.56**	**35,824.21**	**261.55 under target (target exceeded)**

Green Island landfill and composting emissions

The significant reduction in waste emissions since baseline year is primarily due to improvements in the landfill gas capture and destruction. Further improvements in gas capture and destruction are anticipated: a new gas flare was installed at Green Island landfill in January 2025. The flare is certified to destroy (burn) more landfill gas than the previous gas flare, which has the effect of lowering emissions per tonne of waste. As the landfill-associated unique emissions factor (UEF) is only calculated after the completion of each calendar year, the reduction in 24/25 emissions associated with this change will be reflected in the IMR 2025/26.

In 2024/25 there was a slight increase in both the quantity of waste landfilled, and the emissions from waste to landfill compared to 2023/24. The 2024/25 financial year has seen composting added into the inventory as emissions source. These shifts relate to changes to DCC's kerbside collection services that came into effect in 2024/25.

From 1 July 2024:

- a fortnightly DCC red bin general waste collection (paid for through rates) replaced the previous (user-paid) weekly kerbside rubbish bag collection
- a new weekly DCC kerbside food and green waste collection service was introduced, with this material collected and composted.

The changes were made to increase the overall rate of diversion of waste (particularly organics) from all landfills. More residual waste entering the DCC-owned Green Island landfill was a predicted side-effect of the change.

Prior to this change, a higher number of Dunedin households were paying private waste companies for kerbside general waste bins and collection. While actual tonnages are not known, some of the waste collected by private companies was being landfilled at private landfills. It is very likely that the DCC is now collecting a significantly higher proportion of Dunedin's kerbside general waste in 2024/25 than in previous years, with all of it disposed of at Green Island landfill. While the side-effect was anticipated and built into EMRP modelling, data limitations make it difficult to state with complete certainty that the increase is due to kerbside changes alone.

Waste to landfill and composting emissions are intertwined. Despite Green Island landfill's increased take of kerbside collections, the tonnes of waste deposited at the landfill increased only 3.17% in 2024/25 (55,284 tonnes in 2024/25, compared with 53,584 tonnes in 2023/24). At the same time, a total of 17,116 tonnes of organic material was also collected at kerbside and composted. The composting of this material is estimated to have generated 3,012tCO_2e - significantly lower than the emissions this material would have generated in landfill.

At this stage it is unknown to what extent the introduction of organics collection has diverted organic material from landfill, as opposed to representing additional material (that may have previously been home-composted). To help answer this question, the DCC are undertaking a survey of material entering Green Island Landfill in late 2025.

Construction is underway on a local DCC owned and operated composting facility (in the interim composting is sent to a private composting facility outside of the district). Progress on projects to divert organic and other waste streams from landfill are outlined 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.

Progress on EMRP actions

EMRP projects that will reduce emissions from waste are set out in the table below. In broad terms they seek to:
• Use resources in a more circular way
• Divert more waste from landfill
• Improve landfill and wastewater gas management.

In 2024/25, **29 of the 40 EMRP actions to address waste to landfill emissions were progressed.** 1 was not advanced, and the remaining 10 EMRP actions are not due to commence until subsequent financial years, as shown in Table 8 below.

As at 30 June 2025:

- 24 were on track to be completed as scheduled (green), and
- 5 were subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber).
- 1 was not on track, with no mitigation currently in place (red).
- 10 are yet to commence (N/A).

Table 8: Waste emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Purchase and install gas engine at Green Island Landfill	R3.8.2	1	2026/27	WES	Green
Continue work to optimise gas capture and destruction at Green Island Landfill	R3.8.3	2	2025/26-2030/31	WES	Green
Construct new Green Island composting facility	R1.3.1	3	2025/26-2026/27	WES	N/A
Deliver kerbside food/garden organics collection service	R1.3.2	4	2024-2031	WES	Green
Explore options to prevent organics entering DCC owned landfills once alternative disposal solutions are available	R1.3.3	5	Ongoing from 2026/27	WES	N/A

Construct Green Island facility for storing timber diverted from landfill	R1.4.1	6	2025/26-2027/28	WES	N/A
Continue collaborating with other councils to identify or create solution for timber and other regional waste processing infrastructure	R1.4.2	7	Ongoing	WES	Green
Explore ways to support the establishment and operation of building deconstruction services	R1.4.7	8	2025/26	WES	Green
Support the establishment and operation of building deconstruction services	R1.4.8	9	2025-2030	WES	N/A
Explore options for a long-term biosolids solution	R3.7.1	10	2023-2027	3W	Green
Deliver long-term biosolids solution	R3.7.2	11	2025-2030	3W	Amber
Provide recycling collection/services/days for rural areas	R1.1.3	12	2023/2024	WES	Red
Explore options for incentives to encourage low carbon, circular, low waste design for construction projects	R1.4.5	13	2025/26	WES	Green
Implement incentives for low carbon, circular, low waste design for construction projects	R1.4.6	14	2025-2030	WES	N/A
Explore with community partners the potential for construction waste re-use hub(s)	R1.4.3	15	2025/26	WES	Green
Support the establishment and operation of construction waste re-use hub(s)	R1.4.4	16	2026/27 -2027/28	WES	N/A
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	R1.5.1	17	2023-2030	WES	Green
Construct new resource recovery park at Green Island to provide infrastructure for waste diversion	R1.5.2	18	2025/26-2027/28	WES	Green
Roll out kerbside recycling collection to some rural areas	R1.5.3	19	2023-2027	WES	Green
Explore how to best support businesses to undertake waste audits and develop waste minimisation plans	R1.5.4	20	2023-2027	WES	Green
Deliver a pilot programme for construction waste separation	R1.4.9	21	2025/26	WES	Green
Undertake and publish case studies on separating construction waste and reducing waste in design	R1.4.10	22	2023-2024	WES	Green
Publish information about best practice for reducing construction material use and waste through design and construction	R1.4.11	23	2023-2027	WES	Green
Continue to develop and support existing resource recovery parks: Green Island, Waikouaiti, Middlemarch	R1.1.1	24	Ongoing	WES	Green
Develop a central city location for collection of recyclable materials and sale of diverted items (a 'second Rummage store')	R1.1.2	25	2026/27-2027/28	WES	Green

Work with community partners to support three or more communities to establish new community-led resource/recycling centres in local neighbourhoods	R1.1.4	26	2025/26-2027/28	WES	Green
Complete business case for a wider network of community-led resource/recycling centres in local neighbourhoods	R1.1.5	27	2025/26	WES	Green
Support communities to operate and develop community-led resource/recycling centres into self-sustaining operating models	R1.1.6	28	2023-2030	WES	N/A
Work with community partners to progressively expand the network of community-led resource/recycling centres	R1.1.7	29	2024-2030	WES	N/A
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	R1.1.8	30	Ongoing	WES	Green
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.	R1.2.1	31	Ongoing	WES	Green
Progress collaborative work on circular economy with partners	R1.2.2a	32	Ongoing	ZC	Green
Encourage and support waste-related improvements to the Land and Water Regional Plan including improving provisions for composting	R1.3.4	34	2023-2027	WES	Amber
Support business to undertake waste audits and develop waste minimisation plans	R1.5.5	36	Ongoing	WES	Amber
Undertake study to determine source of paper sent to landfill	R1.6.3	37	2025/26	WES	Amber
Use findings from R1.6.3 to plan and implement actions to reduce, re-use, or recycle paper	R1.6.4	38	2024-2030	WES	N/A
Undertake study to determine source and composition of textiles sent to landfill	R1.6.5	39	2025/26	WES	Amber
Use findings to plan and implement actions to reduce, re-use, or recycle textiles	R1.6.6	40	2024-2030	WES	N/A

Closed landfills

Background

The DCC report on emissions from closed landfills managed and owned by the DCC. 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. Closed DCC landfills reflected in the inventory include at North Taieri, Middlemarch, Forrester Park, Sawyers Bay and Waikouaiti.

Tracking against EMRP targets

Figure 7 below shows the projected closed landfill emissions through to 2030/31 if no intervention is taken. As such, DCC can expect to see emissions decline from DCC owned closed landfills over the coming years.

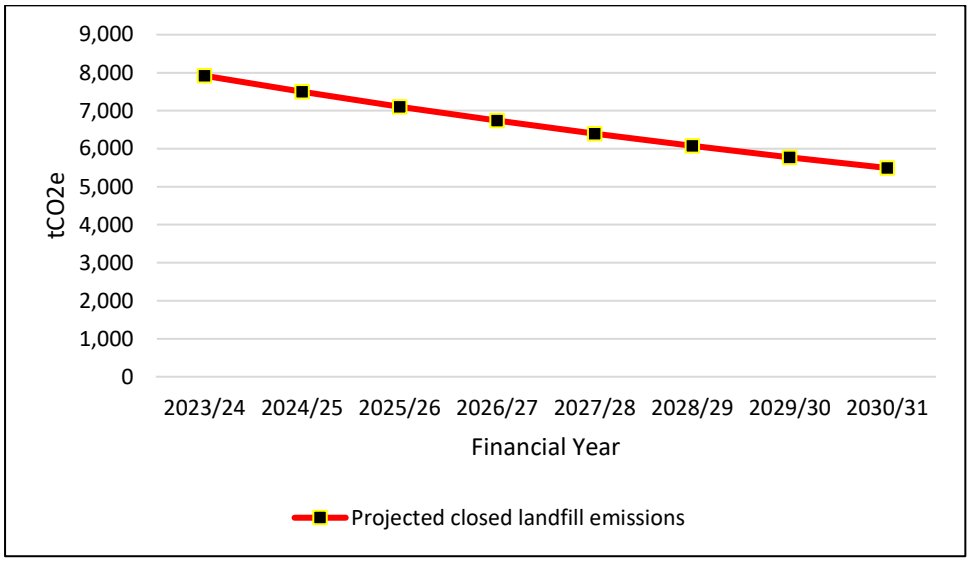


Figure 7. Projected emissions from the DCC's closed landfills 2023/24-2030/31

Progress on EMRP actions

There are no actions included within the EMRP to address emissions from closed landfills. The scale and form of each landfill renders it unviable to capture and destroy landfill gas generated at these sites.

Waste generated from DCC operations

Background

Emissions associated with waste generated by DCC's own operations are now included as a separate inventory item under 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 in DCC's emissions inventory as Category 1/Scope 1 emissions.

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 baseline year.

Progress on EMRP actions

DCC has previously completed waste audits for the Civic Centre building, with waste minimisation initiatives such as recycling, and paper towel replacement implemented.

DCC are also working to incorporate waste generated by DCC suppliers, such as that generated in construction, into the emissions inventory over time, as part of major suppliers emissions reporting (see section 2.4.3). However, as indicated above, it will be important to

ensure these emissions are not double counted given all emissions from Green Island are captured in the DCC's reporting.

2.4.2 Wastewater Treatment Emissions

Background

Emissions associated with wastewater treatment and disposal are the second largest emissions source within DCC's inventory, accounting for **16% of emissions in the 2024/25 financial year**. Emissions from operation of wastewater treatment plants (WWTPs) and disposal of sludge are also significant within the waste to landfill emissions (sludge deposited at Green Island and private landfills) and stationary diesel emissions (Tahuna, Mosgiel and Green Island WWTP stationary diesel usage).

2023/24 was the first year where WWTP emissions were reported using time series data throughout the financial year at Tahuna, Mosgiel and Green Island WWTPs. This led to a significant increase in the calculated emissions for Green Island, Mosgiel, and Tahuna WWTPs relative to the method used in previous financial years. DCC's 3 Waters team confirmed there has been no significant change in wastewater treatment processes had occurred across these three sites between 2019/20 and 2023/24. As such, 2023/24 has been adopted as the new baseline going forward, to enable direct comparison of emissions over time using the same methodology.

Tracking against EMRP targets

Table 9 below provides a detailed overview of EMRP targets for the wastewater treatment emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Overall, WWTP emissions in 2024/25 were 41.38tCO_2e above the 2030/31 EMRP target.

Population-based emissions estimates for emissions from smaller WWTPs (Middlemarch, Warrington, Waikouaiti and Seacliff) remained the same.

Table 9: Wastewater treatment plant emissions (biological processes)

Emissions Source	EMRP Baseline 2023/24 (tCO2e)	*EMRP target 2030/31[8] (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Tahuna WWTP	5219	*5140*	5,637.79	5,181.38	**41.38 above target (target not yet achieved)**
Mosgiel WWTP	743	*740.78*	801.07	740.78	**No change (target achieved)**
Green Island WWTP	3644	*3199.22*	3,643.84	3,199.22	**No change (target achieved)**

[8] EMRP targets differ compared with those listed in the DCC's EMRP 2023/24-2030/31. This is due to an update to the methodology to calculate WWTP emissions since the EMRP was adopted. The new targets are based on the new methodology, and completion the relevant EMRP projects as per the 2023/24-2030/31 EMRP.

Small WW facilities (Middlemarch, Warrington, Waikouaiti, Seacliff)	278	*278.09*	278.09	278.09	**No change (target achieved)**
Total	**9884**	***9,358***	**10,360.79**[9]	**9,399.46**	**41.38 above target (target not achieved)**

Progress on EMRP actions

The modelled emissions for 2030/31 are based on known actions to reduce emissions from wastewater treatment, namely the installation of a flare at Mosgiel WWTP to destroy the methane it generates. Further work is required to better understand emissions generated at the major WWTPs before additional specific actions can be identified – this work is underway.

In 2024/25, **all 7 EMRP actions to address wastewater treatment emissions were progressed**.

As at 30 June 2025:

- 5 were on track to be completed as scheduled (green); and
- 2 were subject to delays or changes in scope, but with emissions reductions still anticipated to be partially or wholly realised (amber)

An overview of wastewater treatment emission reduction projects is presented below:

Table 10: Wastewater treatment emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Explore options for a long-term biosolids solution	R3.7.1	10	2023-2027	3W	Green
Deliver long-term biosolids solution	R3.7.2	11	2025-2030	3W	Amber
Deliver a gas flare at Mosgiel Waste Water Treatment Plant	R3.8.4	41	2025/2026	3W	Green
Undertake monitoring and explore other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes	R3.8.5	42	2025/26-2026/27	3W	Green
Implement other improvements to the capture and destruction of greenhouse gases produced in wastewater treatment processes	R3.8.6	43	2025-2030	3W	Amber
Build Zero Carbon considerations into 3 Waters Integrated System Planning	R3.7.3	44	Complete	3W	Green

[9] Of this total, 9,941.80tCO2e is Category 1/Scope 1 Direct emissions, however 419tCO2e is Category 4/Scope 3 emissions associated with untreated sludge from Tahuna WWTP being deposited at a private landfill.

Implement outcomes of 3 Waters Integrated System Planning	R3.7.4	45	2024-2030	3W	Green

2.4.3 Major Supplier Emissions

Background

Major suppliers generated **9% of DCC's emissions in 2024/25**. As discussed in Chapter 1, the DCC continues to expand the number of contractors reported in the emissions inventory. As a result of these improvements in suppliers reporting and a planned increase in the DCC's capital works programme, reported emissions from this source are expected to increase.

Tracking against EMRP targets

Table 11 below provides a detailed overview of EMRP targets for the major supplier emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Overall, emissions from major suppliers in 2024/25 were 1,436.41tCO_2e above the 2030/31 EMRP target.

Table 11: Major Supplier emissions

Major Supplier Emissions by source	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Total	***3,769.41***	**5,111.92**	**5,205.82**	**1,436.41 above target (target not yet achieved)**

The EMRP modelling anticipated contractors' fleet aligning with Procurement Emissions Standards over the period to 2030. It is likely there will be additional opportunities to reduce emissions through emerging technology in other areas, as well as through smarter design.

The increase in contractor emissions in 2024/25 was driven by the introduction of the new kerbside collection service. An increase in the services offered drove a small increase, but the majority of the increase in emissions was associated with organics material being trucked to a private composting facility in Timaru until a DCC run facility at Green Island is constructed. Emissions from kerbside collection services are expected to significantly reduce once DCC's local composting facility is operational.

Progress on EMRP actions

In 2024/25, **all EMRP actions to address major supplier emissions were progressed**. As at 30 June 2025, all were on track to be completed as scheduled (green).

An overview of major supplier emission reduction projects is presented below:

Table 12: Major Supplier emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Provide further guidance for teams on how to achieve emissions reductions through procurement, including standard clauses and specifications that can be included in contracts.	EMRP	79	2024-2025	ZC	Green
Implement standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers	C4.8.1	81	2023-2030	Procurement	Green

2.4.4 Stationary Energy

Background

Stationary energy (electricity, diesel, LPG, and biomass) use in DCC buildings and facilities generated a combined **11% of DCC emissions in 2024/25**. Across all stationary energy sources, there is a need to both improve energy efficiency and to decarbonise energy supply.

While there are connections between the end-uses of electricity, LPG and stationary diesel used at DCC (a variety of fuels might be use in one facility), emissions from each source are reported separately. 2024/25 saw the first year of emissions from the use of biomass incorporated in the inventory, linked to the opening of Te Puna o Whakaehu.

Tracking against EMRP targets

Table 13 below provides a detailed overview of EMRP targets for the stationary energy emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Overall, emissions from stationary energy in 2024/25 were 3,341tCO_2e above the 2030/31 EMRP target, with shortfalls across all emission types. Key drivers for the changes within each energy sources are discussed below.

Table 13: Stationary Energy emissions overview

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	EMRP target 2030/31 (tCO2e)	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Stationary LPG	1,908.56	309.62	2,700.05	2,368.09	**2,058.47 above target (target not yet achieved)**
Electricity (incl. T&D losses)	4,003.26	2,509.41	2,773.32	3,157.59	**648.18 above target (target not yet achieved)**
Stationary Diesel	752.97	120.42	605.66	592.59	**485.24 above target (target not yet achieved)**
Biomass	8.70	NA	178.85	162.70	
Total	**6,673.49**	**2,939.45**	**6,257.88**	**6,280.97**	**3,341.52 above target (target not yet achieved)**

Stationary LPG

Background

Stationary LPG **generated 4% of DCC's emissions in 2024/25**.

The majority of DCC stationary LPG is used to heat Moana Pool, which in 2024/25 accounted for 57% of total stationary LPG use. Space heating of DCC buildings in the CBD accounted for a further 17% of total stationary LPG use.

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).

Tracking against EMRP targets

Table 15 below provides a detailed overview of EMRP targets for the stationary LPG emissions category by consumption site, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Overall, emissions from stationary LPG use in 2024/25 were 2,187tCO_2e above the 2030/31 EMRP target, with shortfalls across all major sites. The reduction in emissions from stationary LPG at Moana Pool in 2024/25 is linked to a fully operational heat recovery system compared to 2023/24.

Table 14: Stationary LPG use by site

Location	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Moana Pool	*0.00*	1,621.12	1,347.34	**1.347.34 above target (target not yet achieved)**
Civic Centre/Library	*0.00*	415.03	399.99	**399.99 above target (target not yet achieved)**
Dunedin Public Art Gallery	*0.00*	274.47	269.20	**269.20 above target (target not yet achieved)**
Andersons Bay Crematorium	*142.43*	143.48	171.07	**28.64 above target**

				(target not yet achieved)
Toitū Early Settlers Museum	*0.00*	109.69	78.45	**78.45 above target (target not yet achieved)**
Caledonian Gym	*0.00*	43.23	0.05	**0.05 above target (target not yet achieved)**
St Clair saltwater pool cafe	*11.43*	13.10	12.30	**0.87 above target (target not yet achieved)**
Other DCC sites	*89.99*	79.93	89.69	**0.30 below target (target achieved)**
Total	***181.08***	**2,700.05**	2,368.09	**2,187.01 above target (target not yet achieved)**

Progress on EMRP actions

As set out in Table 15, projects in the EMRP seek to address the most significant LPG emissions sources. The Andersons Bay Crematorium is anticipated to be the most technically difficult source to displace due to the ageing building structure as well as the high heat requirements.

Smaller sources ('other DCC sites') are not a focus of DCC within the 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.

In 2024/25, **6 of the 7 EMRP actions to address stationary LPG emissions were progressed.**

As at 30 June 2025:

- 2 was on track to be completed as scheduled (green);
- 4 were subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber)
- 1 was not on track, with no mitigation currently in place (red).

An overview of stationary LPG emission reduction projects is presented below:

Table 15: Stationary LPG emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
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	E1.2.3	49	2023-2027	Property	Amber

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	E1.2.4	50	2024-2030	Property	Amber
Deliver heat recovery system at Moana Pool	E1.2.1	51	2025-2027	PARS	Amber
Implement changes to displace LPG used for hot water heating at Moana Pool	E1.2.2	52	2024-2030	PARS	Red
Explore options to improve the overall energy efficiency and displace stationary LPG use at Andersons Bay Crematorium	E1.2.10	53	2023-2027	PARS	Green
Implement preferred option to improve the overall energy efficiency and displace LPG use at Andersons Bay Crematorium	E1.2.11	54	2025-2026	PARS	Green
Explore and implement other upgrades to improve energy efficiency and displace stationary diesel and LPG use at other PARS facilities	E1.2.12	55	2023-2030	PARS	Amber

Electricity (including transmission and distribution losses)

Background

Electricity generated **5% of DCC's emissions in 2024/25.**

Tracking against EMRP targets

The increase in emissions from electricity during 2024/25 was primarily due to a smaller share of renewable electricity generation in the national grid that increased the emissions per kWh (the relative share of renewable electricity generation decreased from 88%[10] in 2023/24 to 88.5%[11] in 2024/25) imported compared to 2023/24. To a lesser extent, a slight increase in overall electricity consumption (0.32%) also contributed to this development. *Progress on EMRP actions*

As set out in Table 16, 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 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

[10] MBIE (2024): Energy in New Zealand 2024.
[11] MBIE (2025): Energy in New Zealand 2025.

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.

In 2024/25, **5 of the 6 EMRP actions to address electricity emissions were progressed.** As at 30 June 2025,

- 3 were on track to be completed as scheduled (green);
- 2 were subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber)
- 1 was not on track, with no mitigation currently in place (red).

Table 16: Electricity emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Upgrading Civic Centre lighting as the first phase of lighting upgrade programme	EMRP	59	2025/2026	Property	Green
Upgrading lighting across three other CBD sites: Dunedin Town Hall/Municipal Chambers, Toitū Early Settlers Museum, and City Library	EMRP	60	2025	Property	Amber
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	EMRP	61	2025	Property	Amber
Consider opportunities for renewable generation associated with 3 Waters infrastructure as part of 3 Waters Integrated System Planning	E3.4.1	62	2023/24	3W	Red
Explore options for renewable energy generation associated with other DCC assets, as part of other energy efficiency and decarbonization work programmes	E3.4.4	63	2023-2030	Property	Green
Implement preferred options for renewable generation associated with other DCC assets	E3.4.5	64	2024-2030	Property	Green

Stationary Diesel

Background

Stationary diesel **generated 1% of DCC's emissions in 2024/25.** The majority of stationary diesel is used at the Tahuna Wastewater Treatment Plant to operate the sludge incinerator. 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. 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.

Tracking against EMRP targets

Table 17 below provides a detailed overview of EMRP targets for the stationary diesel emissions category by consumption site, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.

Overall, emissions from stationary diesel use in 2024/25 were 472tCO_2e above the 2030/31 EMRP target. In 2024/25, the emissions related to stationary diesel consumption for Tahuna and Mosgiel WWTPs as well as the Musselburgh WW pump station were above the 2030/31 EMRP emissions target. All other diesel consuming sites achieved the 2030/31 EMRP target.

Table 17: Stationary diesel use by site

Location	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Tahuna WWTP	*0.00*	543.73	472.40	**472.40 above target (target not yet achieved)**
Mosgiel WWTP	*27.22*	50.96	74.61	**47.39 above target (target not yet achieved)**
Southern Water Treatment Plant pump	*75.25*	0.63	3.90	**71.35 below target (target exceeded)**
Green Island WWTP	*6.92*	4.55	1.71	**5.21 below target (target exceeded)**
Musselburgh WW PS/screening plant	*11.05*	5.79	39.97	**28.92 above target (target not yet achieved)**
Botanic Garden	*0.00*	0.00	0.00	**0.00 (target achieved)**
Total	***120.42***	**605.66**	**592.59**	**472.17 above target (target not yet achieved)**

There was a slight reduction in emissions from stationary diesel use in 2024/25 compared with 2023/24. Stationary diesel consumption at Tahuna WWTP was down due to continuous improvements to the sludge incinerator to reduce the build-up of ash as sludge is combusted. This upgrade was made part way through the 2023/24 financial year. 2024/25 saw the first full year of effects post the upgrade of the incinerator. The reductions seen at Tahuna in 2024/25 are likely to be enduring.

Reductions in stationary diesel consumption at Green Island WWTP are in part due to operational improvements made to the biogas boilers and reduced diesel used for digester heating. The increase of stationary diesel emissions at Mosgiel WWTP is linked to significant heavy rainfall events during 2024/25. Heavy rainfall events lead to increased stationary diesel consumption due to the use of diesel generators to supplement electric pumps.

Heavy rainfall in 2024/25 events also led to increased diesel used at Musselburgh WW Pump Station/screening plant.

Progress on EMRP actions

As set out in Table 18, there is a project underway to find a long-term alternative solution to the combustion of sludge at Tahuna WWTP. Short term actions to optimise use of the incinerator, such as installing an ash clarifier to remove ash from the incinerator, were completed in 2023/24. This has reduced the amount of diesel required to incinerate sludge,

as the higher the percentage of ash is mixed with the sludge, the more heat is required to burn the remaining organic material.

Continued work to optimise the biogas boilers at both Green Island and Mosgiel WWTPs will ensure baseline stationary diesel consumption from these sites is minimised.

Completely displacing the use of diesel for power generation in severe weather events or remote locations in the 3 Waters network may be difficult, however DCC will investigate what options are available to reduce reliance on stationary diesel for such purposes.

In 2024/25, **7 of the 9 EMRP actions to address stationary diesel emissions were progressed.** As at 30 June 2025,

- 4 were on track to be completed as scheduled (green)
- 3 were subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber)
- 2 were not on track, with no mitigation currently in place (red).

An overview of stationary LPG emission reduction projects is presented below:

Table 18: Stationary diesel emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Explore options for a long-term biosolids solution	R3.7.1	10	2023-2027	3W	Green
Deliver long-term biosolids solution	R3.7.2	11	2025-2030	3W	Amber
Build Zero Carbon considerations into 3 Waters Integrated System Planning	R3.7.3	44	Complete	3W	Green
Implement outcomes of 3 Waters Integrated System Planning	R3.7.4	45	2024-2030	3W	Green
Explore options to displace stationary diesel use at wastewater treatment plants	E1.2.7	46	2023-2027	3W	Amber
Implement preferred options to displace stationary diesel use at wastewater treatment plants	E1.2.8	47	2024-2030	3W	Amber
Explore and implement other upgrades to improve energy efficiency and displace stationary diesel use at other 3W facilities	E1.2.9	48	2024-2030	3W	Red
Consider opportunities for renewable generation associated with 3 Waters infrastructure as part of 3 Waters Integrated System Planning	E3.4.1	62	2023/24	3W	Red

Implement preferred options for renewable generation associated with other DCC assets	E3.4.5	64	2024-2030	Property	Green

2.4.5 Water treatment chemicals

Background

Water treatment chemical use **generated 3% of DCC's emissions in 2024/25.**

To date, DCC is only reporting on chemical use in Water Treatment Plants (WTPs). In future there may be further emissions associated with the liming of sludge from Tahuna wastewater treatment plant to allow for its safe disposal at Green Island landfill (to date the liming plant has not been operational). Emissions from chemicals used for water treatment are based on emission factors sourced from a variety of sources, including the American Chemical Council, the AusLCI Shadowdatabase, and others.

Tracking against EMRP targets

Table 19 below provides a detailed overview of EMRP targets for water treatment chemical use, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target. **Emissions from water treatment chemical use in 2024/25 were 202tCO_2e under the 2030/31 EMRP target.**

Table 19: Water treatment chemical emissions

Location	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Water treatment Chemical Emissions	2,075.36	*2,127.54*	2,195.53	1,872.62	**202.74 below target (target exceeded)**

Progress against EMRP actions

Opportunities to reduce water treatment chemical use emissions are limited by regulatory and operational requirements. The 3 Waters team is constantly looking at ways to optimise chemical consumption (reduce the use wherever possible by optimising plants and processes). Initial reviews have been focused on Mt Grand and Southern WTPs. Whenever possible the DCC is procuring chemicals locally.

In 2024/25, **all 4 EMRP actions to address 3 Waters chemical emissions were progressed.** As at 30 June 2025:

- 3 were on track to be completed as scheduled (green);
- 1 was subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber).

Table 20: Water treatment chemicals emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Build Zero Carbon considerations into 3 Waters Integrated System Planning	R3.7.3	44	Complete	3W	Green
Implement outcomes of 3 Waters Integrated System Planning	R3.7.4	45	2024-2030	3W	Green
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	R1.6.7	77	Ongoing	ZC	Amber
Identify opportunities to reduce emissions from chemicals use, and implement changes	R1.6.8	78	Ongoing	ZC	Green

2.4.6 Staff Travel to and From Work

Background

Staff travel to and from work **generated 1% of DCC's emissions in 2024/25.**

Almost 90% of the staff travel to/from work emissions are associated with use of 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.

Tracking against EMRP targets

Table 21 below provides a detailed overview of EMRP targets for the staff travel to and from work emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target. **Overall, emissions from staff travel to and from work in 2024/25 were 349tCO_2e above the 2030/31 EMRP target.**

Table 21: Staff Travel To and From Work Emissions

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Staff travel to work (alone and carpooling) – Internal Combustion Engine (ICE) + Hybrid	432.12	*190.98*	427.57	513.58	**349.29 above target (target not yet achieved**
Staff travel to work - Bus	48.69	*24.15*	48.69	56.06	
Staff travel to work - Motorcycle/Motor scooter	8.63	*8.63*	8.66	5.46	
Staff travel to work - EV (alone and carpooling)	2.73	*6.09*	2.12	3.85	
Staff travel to work - taxi	0.14	*0.14*	0.10	0.16	
Staff travel to work - E-scooter	0.03	*0.03*	0.45	0.21	

Staff travel to work - bike	0.00	*0.00*	0.00	0.00	
Staff travel to work - walk	0.00	*0.00*	0.00	0.00	
Total	**503.50**	***230.03***	**487.59**	**579.32**	

Changing the way staff travel to and from work across Dunedin is also a focus for Zero Carbon Plan actions targeting city-scale emissions. The projected emissions by 2030/31 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.

For 2024/25, staff travel to work emissions were calculated using travel survey data from 2024/25. This contrasts with 2023/24 where no travel survey was conducted and data from 2022/23 was incorporated.

Progress on EMRP actions

As set out in Table 22, the emissions reduction projects included for staff travel to/from work 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. Some of these actions have been progressed jointly with other parties to the Zero Carbon Alliance.

In 2024/25, **7 of the 11 EMRP actions to address emissions from staff travel to and from work were progressed**. As at 30 June 2025:

- 4 were on track to be completed as scheduled (green);
- 3 were subject to delays or changes in scope, but with emissions reductions still anticipated be partially or wholly realised (amber);
- 4 is not on track, with no mitigation currently in place (red).

Table 22: Staff travel to and from work emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Implement flexible working policy across DCC to enable working from home where appropriate	T3.7.2a	66	Ongoing	ZC	Green
Investigate options to encourage and enable greater uptake of e-bikes by ZCA staff.	T5.15.7e	67	2024		Amber
Implement preferred e-bike option across ZCA organisations (including DCC)	T5.15.7f	68	2025		Amber
Work with Otago Regional Council public transport team on the potential for improved public transport options for ZCA staff, like monthly passes.	T5.15.7a	69	2024	ZC	Red

Implement preferred public transport initiative across ZCA organisations (including DCC)	T5.15.7b	70	2024/25	ZC	Red
Investigate options for a sustainable travel budget initiative across ZCA organisations, with the focus to remove barriers for those with dependants to use sustainable travel options. Options could include, but are not limited to, initiatives such as a guaranteed ride home scheme	T5.15.7c	71	2024/25	ZC	Red
Implement preferred sustainable travel budget initiative across ZCA organisations (including DCC)	T5.15.7d	72	2024/25		Red
Review and upgrade DCC end of trip facilities, such as bike sheds	T5.15.7g	73	2024	Transport	Amber
Promote end of trip facilities for DCC Staff	T5.15.7h	74	2023-2030	Transport	Green
Internal DCC communications and engagement on sustainable travel options and initiatives	T5.15.7i	75	2023-2030	Transport	Green
Continue to undertake annual DCC staff travel surveys	T5.15.7j	76	2023-2030	Transport	Green

2.4.7 Fleet Fuel

Background

Fleet fuel **generated 1% of DCC's emissions in 2024/25**.

Tracking against EMRP targets

Table 22 below provides a detailed overview of EMRP target for the fleet fuel emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target. **Overall, emissions from fleet fuel in 2024/25 were 319tCO_2e above the 2030/31 EMRP target.**

Table 23: Fleet fuel emissions

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Fleet Fuel	488.32	*116.60*	432.72	436.08	**319.48 above target (target not yet achieved)**

Fleet fuel emissions are down compared to the baseline year (currently down 11%). However, emissions from DCC petrol vehicles increased in the 24/25 reporting period compared with 2023/24. Compared to the 2018/19 baseline year, emissions reduced due to investments in plug-in hybrid (PHEV) and electric vehicles (EV). DCC's fleet diesel use had been increasing in

recent years, largely due to 3 Waters activity. There was a slight reduction in 2024/25 fleet diesel use compared with 2023/24.

Progress on EMRP actions

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 the 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 zero tailpipe emissions from DCC fleet vehicles. The report indicated a number of 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 car share, e-bikes or use of public transport (pending a greater market supply of EV utility vehicles, and sufficient charging infrastructure).

Actions to address emissions from fleet fuel will be progressed in 2025/26 and beyond.

Table 24: Fleet emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Invest in infrastructure to support continued DCC fleet electrification	T7.21.3	56	2025/26	Property/Fleet	Green
Implement the recommendations of the Fleet Optimisation Study	N/A	57	2024-2025	Property/Fleet	Amber

2.4.8 Business Travel

Business travel **generated 1% of DCC's emissions in 2024/25**.

Tracking against EMRP targets

Table 24 below provides a detailed overview of EMRP targets for the business travel emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target. **Overall, emissions from business travel in 2024/25 were 77tCO_2e above the 2030/31 EMRP target,** split across most emissions sources.

Table 25: Business Travel emissions

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Air Travel	312.07	*37.96*	115.37	106.37	**68.41 above target (target not yet achieved)**
Private cars	21.29	*16.02*	23.71	22.51	**6.49 target (target not yet achieved)**
Taxis	2.46	*0.88*	0.88	0.64	**0.24 below target**

					(target exceeded)
Hotel Stays	1.37	*1.18*	2.42	2.39	1.21 above target (target not yet achieved)
Rental cars	0.00	*0.15*	0.24	0.97	0.82 above target (target not yet achieved)
Total	**337.19**	***56.19***	**142.62**	**132.88**	76.69 above target (target not yet achieved)

The pandemic interrupted business-as-usual travel for the organisation, and in the post-pandemic years DCC management has used budget levers to set different expectations of departments with regards to travel.

Progress against EMRP actions

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 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.

As set out in Table 26, there is one EMRP action to address emissions from business travel, which is subject to some changes in scope but emissions reductions are still anticipated be partially realised.

Table 26: Business travel emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Implement initiatives to achieve target of a 25% reduction in air travel by 2026/27 compared to 2022/23 levels, include using alternatives to travel where practicable (such as videoconferencing), using alternative travel modes where possible (such as carpooling to/from Christchurch in a DCC EV/PHEV where multiple staff are attending the same event/meeting), or reducing team travel budgets	EMRP	65	2023/2024-2026/2027	Across DCC	Amber

2.4.9 Fertiliser and Refrigerants

Background

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

Emissions from fertiliser come from nitrogen applied to DCC operated recreational facilities across Dunedin city.

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. Relevant DCC Procurement Emissions Standards are in place to mitigate this risk.

Tracking against EMRP targets

Table 27 below provides a detailed overview of EMRP targets for fertiliser and refrigerant emissions category, a summary of emissions for the last two financial years, as well as the 2024/25 emissions tracking against the 2030/31 EMRP target.**Overall, emissions from fertiliser and refrigerant emissions in 2024/25 were 56tCO_2e above the 2030/31 EMRP target.**

Table 27: Fertiliser and Refrigerant Emissions

Emissions Source	EMRP Baseline 2018/19 (tCO2e)	*EMRP target 2030/31 (tCO2e)*	2023/24 (tCO2e)	2024/25 (tCO2e)	2024/25 tracking against 2030/31 target (tCO2e)
Refrigerant Leakage	368.90	*96.41*	253.78	149.43	**53.02 above target (target not yet achieved)**
Fertiliser	32.90	*11.77*	15.67	14.20	**2.43 above target (target not yet achieved)**
Total	**401.80**	***108.18***	**269.45**	**163.63**	**55.45 above target (target not yet achieved)**

A significant reduction in emissions from refrigerants in 2024/25 was achieved due to a leak detection system now operating, alerting maintenance teams and keeping losses to a minimum.

Progress against EMRP actions

No alternative to the use of 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.

Effective management of existing refrigerant systems, as well as careful selection of refrigerant systems to install, is important to ensure emissions from refrigerants are minimised in the coming years.

As set out in Table 28, there are two EMRP projects relating to refrigerants. In 2024/25, the actions to address emissions from refrigerants were on track to be completed as scheduled.

Table 28: Refrigerant emissions reduction projects

Project	Zero Carbon Plan action #	EMRP Project #	Timeframe	Lead Team	Tracking 2024/25
Continue to reduce the GWP of refrigerants on DCC property, as part of other energy efficiency and decarbonization work programmes	E4.6.1	58	2023-2030	Property	Green
Implement standardised approach to give effect to the Zero Carbon Policy through procurement, including guidance and support for DCC staff and suppliers	C4.8.1	81	2023-2030	Procurement	Green

2.5 Staff Engagement

Relevant DCC teams provided input into the development of the EMRP, and are regularly engaged as part of reporting. Information regarding the EMRP and DCC emissions reduction targets is also published on the intranet. Other avenues for staff engagement include conversations with teams, and ELT leadership.

Zero Carbon Policy guidance documents have been developed and published internally. Much of DCC's work takes place through procurement and in the delivery of projects. Procurement emissions standards have been developed and Zero Carbon considerations are being piloted as part of the DCC's evolving project management framework.

Additional support is provided to teams and staff by the Zero Carbon team on an as required basis.

2.6 Monitoring and Reporting

As the Programme Director, the Manager - Zero Carbon is responsible for work programme oversight, management and coordination. This includes establishing processes for regular reporting to ELT and/or Council.

Appendix 1: Detailed Greenhouse Gas Inventory

Additional inventory details are disclosed in the tables below.

Table A1.1: GHG emissions and removals, quantified for each applicable gas 2024/25

Scope	Inventory Category	tCO2e	Carbon Dioxide	Nitrous Oxide	Methane	Sulphur Hexafluoride	HFC's	Other
1	Direct	48,983.2	3,378.0	44.3	7,448.6	0.00	149.4	34,954.8
2	Indirect - energy	2,934.4	2,849.7	5.5	79.2	0.00	0.00	0.00
3	Indirect - products used	7,342.7	5,311.0	68.1	28.5	0.00	0.00	1,926.0
	Indirect transportation	713.5	663.5	15.0	5.5	0.00	0.00	2.4
Total		59,973.8	12,202.2	132.9	7,561.9	0.00	149.4	36,883

A1.1 Reporting Boundaries

A1.1.1 Emission Source Identification Method and Significance Criteria

The GHG emissions sources included in this inventory are those identified with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standard.

Significance of emissions sources within the organisational boundaries has been considered in the design of this inventory. The significance criteria used comprise:

All direct emissions sources that contribute more than 1% of total Category 1 and 2 emissions

All indirect emissions sources that are required by the ISO 14064-1:2018 standard, and additional indirect emissions sources which meet DCC's significance criteria. Further details on the significance criteria used to determine which indirect emissions sources to include can be found in Appendix 2.

A1.1.2 Included Sources and Activity Data Management

As adapted from ISO 14064-1, the emissions sources deemed significant for inclusion in this inventory were classified into the following categories:

- **Direct GHG emissions (Category 1):** GHG emissions from sources that are owned or controlled by the company.
- **Indirect GHG emissions (Category 2):** GHG emissions from the generation of purchased electricity, heat and steam consumed by the company.

- **Indirect GHG emissions (Categories 3-6):** GHG emissions that occur because of the activities of the company but occur from sources not owned or controlled by the company.

Table A1.2 provides detail on the categories of emissions included in the GHG emissions inventory, an overview of how activity data were collected for each emissions source, and a qualitative assessment of any uncertainties or assumptions made based on the source of activity data. In this context, a quantitative assessment was determined cost and resource prohibitive. A qualitative assessment was undertaken instead. Detail on estimated numerical uncertainties are reported in Table A1.2.

Table A1.2: GHG emissions activity data collection methods and inherent uncertainties and assumptions

Business unit	GHG emissions source	GHG emissions level Category	Data Source	Data collection unit	Uncertainties
3 Waters and Transition (3 Waters)	Wastewater treatment process emissions	Category 1	Operational wastewater data inputs in line with requirements of Water NZ Carbon Accounting Guidelines Operational time-series wastewater data	Various	Assumed that data is complete and accurate, however aware some data is incomplete. Data confidence: Medium Collection and processing of time series activity data at Tahuna, Mosgiel and Green Island WWTPs has been outsourced since the 2023/2024 financial year. Assume that calculations are meeting Water NZ standards.
3 Waters and Transition (3 Waters)	Wastewater treatment process emissions	Category 4	Internal data on sludge deposited at private landfill	tCO_2e	Assumed that data (DCC internally) is complete and accurate. Data confidence: High
3 Waters and Transition (3 Waters)	Diesel - Stationary	Category 1	Annual departmental spend on fuel diesel and litres provided in the supplier invoices.	l	Potential that other stationary diesel combustion may not be recorded (such as for mobile plant such as diesel generators where fuel cards may be used to purchase fuel), however, these are expected to be of immaterial nature in the context of the overall inventory.

					Ministry for the Environment (MfE) emissions factor uncertainties +-0.5% in 2025 emissions factor guide. Data confidence: High
Across teams with dedicated fleet, as well as shared fleet	Diesel transport [Volume]	Category 1	Fuel Usage Report provided by Council's FleetCard provider (FleetSmart).	l	Assumed that all fuel purchases are paid for via Fleet Card as per organisation policy. MfE emissions factor uncertainties stated in 2025 emissions factor guide as +-0.9%. Data confidence: High
Consumption attributed to teams based on location	Electricity - default	Category 2	Environmental (actual used) electricity report received from Smartpower. Invoice data can be checked in Esmart, Smartpower's online portal for clients to use.	kWh	Assumed that data is complete and accurate. No uncertainty assessment provided within 2025 MfE emissions factor guide. Qualitative statement from the 2024 Detailed Emissions Guide: *Using an annual average grid emission factor for electricity will inevitably introduce a certain level of inaccuracy, as the generation mix varies depending on your geographical location, by time of day and time of year. We derived the emission factors in Table 9 and Table 10 for purchased electricity from generation data rather than consumption data.* Data confidence: High
Consumption attributed to teams based on location	LPG - commercial [Energy]	Category 1	Environmental (actual used) LPG report received from Smartpower. Invoice data can be checked in Esmart, Smartpower's online portal for clients to use.	kWh	Assumed that data is complete and accurate. MfE emissions factor uncertainties +-2.4% in 2025 emissions factor guide. Data confidence: High

Consumption attributed to teams based on location	Diesel - commercial [Energy]	Category 1	Fuel Usage Report provided by Mini Tankers Ltd.	l	Assumed that data is complete and accurate. MfE emissions factor uncertainties +-0.5% in 2025 emissions factor guide. Data confidence: High
Consumption attributed to teams based on location	Biomass [Energy]	Category 1	Fuel Delivery report provided by Lumbr Ltd.	t	Assumed that data is complete and accurate. MfE emissions factor uncertainties +-36% in 2025 emissions factor guide. Data confidence: High
Arts, Culture, and Recreation (Parks and Recreation Services)	Nitrogen	Category 1	Fertiliser Application Workbook, provided by DCC Parks Department	kg Nitrogen	Assumed that data provided is complete and accurate. MfE emissions factor uncertainties +-54% in 2025 emissions factor guide. Data confidence: Medium
Across teams with dedicated fleet, as well as shared fleet	Petrol - transport, premium	Category 1	Fuel Usage Report provided by Council's FleetCard provider (FleetSmart).	l	Assumed that all fuel purchases are paid for via Fleet Card as per organisation policy. MfE emissions factor uncertainties +-1.7% in 2025 emissions factor guide. Data confidence: High
Across teams with dedicated fleet, as well as shared fleet	Petrol - transport, regular	Category 1	Fuel Usage Report provided by Council's FleetCard provider (FleetSmart).	l	Assumed that all fuel purchases are paid for via Fleet Card as per organisation policy. MfE emissions factor uncertainties +-1.7% in 2025 emissions factor guide. Data confidence: High
Council Operations	Private Car - average (all fuel types)	Category 1	Report on all reimbursements for private car use provided by DCC Finance Department.	$ (NZD)	Assumed that the majority of personal car use for DCC purposes will be claimed for by staff. Assumed all private car use is in petrol vehicles, due to lack of data on private vehicle type used. Uncertainty for the default petrol travel emissions factor is not stated in the MfE 2025 emissions factor guide. Data confidence: High

Reported to teams based on purchase orders used when booking	Public transport - air travel domestic (average)	Category 3	Environmental Impact Report provided by Council's Travel Agent (Orbit Corporate Travel) and passengers kilometres report provided by Air New Zealand	pkm	Assumed that the majority of travel is through Orbit or Air New Zealand and charged to corporate codes. Uncertainty for the air travel emissions factors are not stated in the MfE 2025 emissions factor guide. Data confidence: High
Reported to teams based on purchase orders used when booking	Public transport - air travel long haul (average)	Category 3	Environmental Impact Report provided by Council's Travel Agent (Orbit Corporate Travel) and passengers kilometres report provided by Air New Zealand	pkm	Assumed that the majority of travel is through Orbit or Air New Zealand and charged to corporate codes. Uncertainty for the air travel emissions factors are not stated in the MfE 2025 emissions factor guide. Data confidence: High
Reported to teams based on purchase orders used when booking	Public transport - air travel long haul (economy)	Category 3	Environmental Impact Report provided by Council's Travel Agent (Orbit Corporate Travel) and passengers kilometres report provided by Air New Zealand	pkm	Assumed that the majority of travel is through Orbit or Air New Zealand and charged to corporate codes. Uncertainty for the air travel emissions factors are not stated in the MfE 2025 emissions factor guide. Data confidence: High
Council Operations	Public Transport - Taxi (NZ$)	Category 3	Report on all expenditure charged to 'Taxi' charge codes in 24/25 FY, provided by DCC Finance Department.	$ (NZD)	Assumed that all taxi use is charged to 'Taxi' code. Data confidence: High
Reported to teams based on purchase orders used when booking	Rental cars	Category 3	Environmental Impact Report provided by Council's Travel Agent (Orbit Corporate Travel) including rental car bookings, with km travelled	pkm	Assume that all rental cars are booked through Orbit. Where km is not provided by Orbit, have assumed 20km travelled per day. Moderate uncertainty due to km data not always being provided, and also the uncertainty of the per km car travel emissions factors themselves.

					Data confidence: Medium
Reported to teams based on purchase orders used when booking	Hotels	Category 3	Environmental Impact Report provided by Council's Travel Agent (Orbit Corporate Travel) including hotel stays	Room per night	Assume that all hotel stays are booked through Orbit and reported through environmental impact report. Moderate to high uncertainty due to use of default emissions factors, which may not reflect actual emissions from the hotel/motel used. Data confidence: Medium
Council Operations	Staff Travel to Work	Category 3	Annual Staff Travel to Work Survey results	pkm	Assumed that the day the travel survey is conducted is a proxy for the travel mode choices of staff for the remaining days of the year. High degree of uncertainty on whether the survey results accurately reflect staff travel habits throughout the year. Data confidence: Low
Climate and City Growth (Waste and Environmental Solutions)	Waste landfilled	Category 1	Waste to landfill data collected by DCC Solid Waste Department as required for Online Waste Management Levy (OWL) System and Emissions Trading Scheme (ETS) reporting. Solid Waste Analysis Protocol 2018 report.	t	Assumed that data is recorded and reported accurately for OWLS and ETS purposes. Low degree of uncertainty with the input data on tonnages and amount of landfill gas captured and destroyed. High degree of uncertainty around first order decay calculations of how much methane waste to landfill generates. DCC uses its own Unique Emissions Factor, updated on an annual basis by an accredited third-party consultant. Data confidence: High
Climate and City Growth (Waste and Environmental Solutions)	Closed landfills	Category 1	Historic data on waste deposited at closed DCC landfills has been input into the IPCC Waste Model for estimating emissions of methane from landfills	tCO2e	Emissions associated with closed landfills are generated based on available data and theoretical IPCC waste calculator for the rate emissions will decay and emit methane in landfill. High degree of uncertainty regarding how accurate this calculation is for the DCC closed landfills. Data confidence: Low

Climate and City Growth (Waste and Environmental Solutions)	Composting	Category 1	Operational data on quantities of composting diverted from landfill (non DCC owned composting facility)	t	Assumed that data is recorded and reported accurately. Uncertainty of MfE composting emissions factor not stated in 2025 guide.
3 Waters and Transition (3 Waters)	Water Treatment Chemicals	Category 4	Operational data on quantities of chemicals used plus their source location have been compared with published emissions factors for each chemical, and distances freight had to travel calculated based on source location	Emissions factor per t, tkm	Emissions factors per tonne of chemical used come from a variety of sources, and as such there are likely to be varying degrees of data reliability. Tkm freight emissions are calculated using MfE default shipping factors, with certain assumptions made around the shipping path travelled. Quantities of chemicals reported at times based on operational staff knowledge of amounts used, rather than a verifiable source such as invoice data. Data confidence: Medium
3 Waters and Transition (3 Waters, Waste and Environmental Solutions, Transport), Arts, Culture and Recreation (Parks and Recreation Services), Corporate Services (Property)	Major supplier emissions	Category 4	Emissions data supplied by 12 major suppliers	Various	Method used to apportion emissions to DCC related work varies depending upon data availability of suppliers. For example, some suppliers have been able to report on emissions on the basis of the plant and vehicles dedicated to DCC work, whereas other suppliers have had to use aggregate emissions figures for Dunedin/Southern region and then apportion DCC emissions on a percentage of revenue basis. Where percentage of revenue used, assume activities undertaken by the supplier for DCC reflect the emissions profile of their overall business. Data confidence: Medium
Reported to teams based on asset location	Refrigerant usage	Category 1	Operational data received from relevant contractors	kg	Assumed that external data is recorded and reported accurately. Data confidence: High
Arts, Culture and Recreation (Parks and Recreation Services)	Fertiliser use	Category 1	Operational data received from internal staff	kg	Assumed that internal data is recorded and reported accurately. Data confidence: Medium

A1.1.3 Excluded Emissions Sources and Sinks

Emissions sources in Table A1.3 have been identified and excluded from this inventory.

Table A1.3: GHG emissions sources excluded from the inventory

Business Unit	GHG emissions source	GHG emissions level scope	Reason for exclusion
General operations	Purchased Goods and Services	Category 4	Embodied emissions from capital goods and services purchased by the DCC are currently not included in the inventory, due to a lack of reliable data. This excludes a range of goods and services such as, for instance, paper, stationary, IT services and goods, cars purchased, office equipment, banking services, insurance services, and others.
General operations	Freight	Category 3	Data could only be collected in $ spent, data in tkm was not available. The materiality of the emissions from this source is expected to be immaterial to this inventory. Where tkm data is available (water treatment plant chemicals), freight emissions have been included.
General operations	Couriers	Category 3	Data could only be collected in $ spent, data in tkm was not available. The materiality of the emissions from this source is expected to be immaterial to this inventory.
General operations	Postage	Category 3	Data could only be collected in $ spent. The materiality of the emissions from this source is expected to be immaterial to this inventory.
General operations	Air travel booked via other means	Category 3	Data is collected via DCC's travel booking agents Orbit and Air New Zealand. Staff are always recommended to book via the appropriate agents, but travel can sometimes be booked via corporate credit cards. The materiality of the emissions from this source is expected to be immaterial to this inventory.
General operations	Cloud based computing services	Category 4	The DCC is considering the inclusion of emissions associated with cloud-based software services and may report on them in IMR 25/26. The emissions may be significant.
General operations	Wastewater treatment chemicals	Category 4	While the DCC is measuring emissions associated with potable water treatment, a full audit of chemicals used elsewhere in the organisation has not yet been completed due to resourcing constraints. The emissions may be significant.
General operations	Tenant electricity and LPG emissions	Category 5	The DCC currently exclude emissions associated with buildings owned by the DCC but tenanted by a third party.
General operations	Reticulated LPG T&D losses	Category 4	The DCC use reticulated LPG, rather than natural gas, for space and water heating in several CBD facilities. The Ministry for the Environment Detailed Emissions Guide 2024 states that while there are transmission and distribution losses for reticulated natural gas, the guide assumes there are no transmission and distribution losses from reticulated LPG due to the composition of the gas (see page 29). As such, no reticulated LPG T&D losses are included in DCC's inventory, in line with MfE guidance.
General operations	DCC CCOs and Investments	Category 5	Emissions generated from DCC investments are excluded from the Inventory Management Report. Please refer to Section 1.3.5 and Section 1.3.6 for more information on the implemented organisational boundary.

A1.2 Quantified Inventory of Emissions and Removals

A1.2.1 Calculation Methodology

A calculation methodology has been used for quantifying the emissions inventory based on the following calculation approach, unless otherwise stated below:

Emissions = activity data x emissions factor

All emissions were calculated using externally verified emissions factor sources such as Ministry for the Environment's detailed emissions guide. Global Warming Potentials (GWP) from the IPCC fifth assessment report (AR5) are the preferred GWP conversion[12]. It is worth noting that the 2023/24 financial year wastewater treatment data uses AR5 GWP 100 while previous measurement periods use AR5 GWP 100 w/CCF.

Where applicable, unit conversions applied when processing the activity data has been disclosed.

There are systems and procedures in place that will ensure applied quantification methodologies will continue in future GHG emissions inventories.

A1.2.3 GHG Storage and Liabilities: Land Use Liabilities

Organisations that own land subject to land-use change may achieve sequestration of carbon dioxide through a change in the carbon stock on that land. Where sequestration is claimed, then this also represents a liability in future years should fire, flood, management activities or other intentional or unintentional events release the stored carbon.

Table A1.4: Land use liabilities (total)

Site name	Total sequestration during reporting period (tCO_2e)	Contingent liability (tCO_2e)	Total potential liability (tCO_2e)
DCC	32,307	172,756	2,868,225

A1.2.3 GHG Storage and Liabilities: GHG Stocks Held On Site

Table A1.5: GHG Stocks held on 30 June 2025

GHG gas stock held	Quantity	Unit	Potential liability (tCO2e)
Diesel	34,560	Litres	92.66
LPG	10,095	Kg	30.00

[12] If emission factors have been derived from recognised publications approved by the programme, which still use earlier GWPs, the emission factors have not been altered from as published.

Refrigerants - R22	6	Kg	10.56
Refrigerants - R134a	162	Kg	210.60
Refrigerants - R404a	22	Kg	86.74
Refrigerants - R407c	509	Kg	826.70
Refrigerants - R410a	519	Kg	998.30

A1.2.4 Supplementary Results

Holdings and transactions in GHG-related financial or contractual instruments such as permits, allowances, verified offsets or other purchased emissions reductions from eligible schemes are reported separately here.

Carbon credit and offsets

No carbon credits or offsets were purchased for the 2024/25 financial year.

Double counting and double offsetting

There are various definitions of double counting or double offsetting. For this report, it refers to:

- Parts of the organisation have been prior offset.
- The same emissions sources have been reported (and offset) in both an organisational inventory and product footprint.
- Emissions have been included and potentially offset in the GHG emissions inventories of two different organisations, e.g., a company and one of its suppliers/contractors. This is particularly relevant to indirect (Categories 2 and 3) emissions sources.
- The organisation generates renewable electricity, uses, or exports the electricity and claims the carbon benefits.
- Emissions reductions are counted as removals in an organisation's GHG emissions inventory and are counted or used as offsets/carbon credits by another organisation.

Double counting / double offsetting has not been included in this inventory.

Appendix 2: Significance Criteria Used

The following quantitative and qualitative criteria are considered to determine which indirect emissions sources to include in the DCC's organisational emissions inventory:

- Data availability and quality
- Staff resourcing
- The magnitude of emissions source
- Level of influence DCC have on the emissions source
- The risk from the emissions source, or opportunity to reduce emissions from this source
- Sector specific guidance
- Whether the emissions source is counted in city-wide emissions reduction targets
- Whether the emissions source needs to be measured in order to meet requirements of our intended inventory use and users

Indirect emissions sources currently excluded from DCC's inventory are periodically assessed against these criteria, to take into account changes over time (for instance, the data availability may improve over time).

There is no prescriptive rule to determine whether an indirect emissions source meets the threshold for inclusion in DCC's inventory. Rather, the assessment is largely qualitative.

Appendix 3: References

International Organization for Standardization, 2018. ISO 14064-1:2018. Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. ISO: Geneva, Switzerland.

Intergovernmental Panel on Climate Change, 2001. IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. Chapter 5: Waste. IPCC: Geneva, Switzerland. https://www.ipcc-nggip.iges.or.jp/public/gp/english/

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Tonkin and Taylor, 2025. UEF Application 2024 – Green Island Landfill.

Water New Zealand, 2021. Carbon accounting guidelines for wastewater treatment: CH4 and N2O. Water New Zealand, New Zealand.

World Resources Institute and World Business Council for Sustainable Development, 2004 (revised). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. WBCSD: Geneva, Switzerland.

World Resources Institute and World Business Council for Sustainable Development, 2015 (revised). The Greenhouse Gas Protocol: Scope 2 Guidance. An amendment to the GHG Protocol Corporate Standard. WBCSD: Geneva, Switzerland.

Appendix 4: Reporting Index

This report template aligns with ISO 14064-1:2018. The following table cross references the requirements against the relevant section(s) of this report.

Section of this report	ISO 14064-1:2018 clause
Cover page	9.3.1 b, c, r 9.3.2 d,
Availability	9.2 g
Chapter 1: Emissions Inventory Report	
1.1. Introduction	9.3.2 a
1.2. Emissions inventory results	9.3.1 f, h, j 9.3.3
1.3. Organisational context	9.3.1 a
1.3.1. Organisation description	9.3.1 a
1.3.2. Statement of intent	
1.3.3. Person responsible	9.3.1 b
1.3.4. Reporting period	9.3.1 l
1.3.5. Organisational boundary and consolidation approach	9.3.1.d
1.3.6. Excluded business units	
Chapter 2: Emissions Management and Reduction Report	
2.1. Emissions reduction results	9.3.1 f, h, j, k 9.3.2 j, k
2.2. Significant emissions sources	
2.3. Emissions reduction targets	
2.4. Emissions reduction projects	9.3.2 b
2.5. Staff engagement	
2.6. Key performance indicators	
2.7. Monitoring and reporting	9.3.2 h
Appendix 1: Detailed greenhouse gas inventory	9.3.1 f, g
A1.1 Reporting boundaries	
A1.1.1 Emission source identification method and significance criteria	9.3.1 e
A1.1.2 Included emissions sources and activity data collection	9.3.1 p, q 9.3.2 i
A1.1.3 Excluded emissions sources and sinks	9.3.1 i
A1.2 Quantified inventory of emissions and removals	
A1.2.1 Calculation methodology	9.3.1 m, n, o, t
A1.2.2 Historical recalculations	
A1.2.3 GHG Storage and liabilities	
A1.2.3.1 GHG stocks held on site	
A1.2.3.2 Land-use liabilities	9.3.3.
A1.2.4 Supplementary results	

A1.2.4.1 Carbon credits and offsets	9.3.3.3
A1.2.4.2 Purchased or developed reduction or removal enhancement projects	9.3.2 c
A1.2.4.3 Double counting and double offsetting	
Appendix 2: Significance criteria used	9.3.1.e
Appendix 3: Certification mark use	
Appendix 4: References	
Appendix 5: Reporting index	

Appendix 5: Baseline Emissions Summary and Recalculation Policy

Category (ISO 14064-1:2018)	Scopes (ISO 14064-1:2006)	Emission Source	Baseline (tCO2e)	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 propogation 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	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 Ho	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**		

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.

Changes in baseline emissions since 2023/24 Inventory Management Report

WWTP Emissions

The baseline emissions for wastewater treatment plants (WWTP) have been updated since the 2023/24 inventory management report.

2023/24 was the first year DCC calculated wastewater treatment plant emissions using time series data from SCADA ID tags for the three largest WWTPs (Green Island, Mosgiel and Tahuna). The emissions calculated for 2023/24 for these three WWTPs differed significantly from WWTP emissions calculations in previous financial years. There were no notable changes in wastewater treatment processes across the three plants in 2023/24 compared to previous financial years to explain this difference. Time series data from SCADA ID tags is not available from the 2018/19 financial year, and as such the same method of emissions calculations cannot be undertaken using 2018/19 WWTP data.

As such, to enable direct comparison of WWTP emissions over time, the 2023/24 WWTP will be used as DCC's baseline WWTP emissions moving forward. This change is in line with DCC's Baseline Emissions Recalculation Policy (above), in that there has been a change in calculation methodology for this emissions source.

Biomass Emissions

DCC started measuring emissions associated with biomass in 2024/25, this is due to a new pool Te Puna o Whakaehu (located in Mosgiel) being opened in 2023 which uses biomass to heat water. Measuring biomass emissions from this facility has brought to light that a small amount of biomass is used in the Botanic Gardens propagation facility, which was operating in 2018/19. Baseline figures have been added accordingly to our inventory.

Other emissions sources added into 2023/24 or 2024/25 inventory with no baseline year emissions

Composting emissions have been added to the 2024/25 inventory. This is due to kerbside organics collection starting from July 2024. As such, there are no DCC composting emissions in 2018/19, so no composting emissions are included in the baseline year.

DCC are currently disposing of some untreated WWTP sludge from Tahuna WWTP at a private landfill out of the district. In 2018/19 this sludge was able to be deposited at the DCC owned and operated Green Island landfill. As such, emissions from sludge are already accounted for within the baseline year figures for waste to landfill.

Appendix 6: Changes in Reported 2023/24 Emissions between 2024/25 IMR and 2023/24 IMR

Category (ISO 14064-1:2018)	Emission Source	2023/2024 Emissions in 2023/24 IMR (tCO2e)	2023/24 Emissions reported in this IMR (tCO2e)	Reason for change
Category 1: Direct emissions	Waste to landfill	25,881.21	25,267.75	The reported waste to landfill emissions in the 2023/24 IMR used the 2023 calendar year verified Unique Emissions Factor for the landfill as a proxy to cover the period of January to June 2024. Following confirmation of the 2024 calendar year Unique Emissions Factor for Green Island landfill, the emissions for January to June 2024 have been recalculated. This has seen a slight reduction in 2023/24 waste to landfill emissions compared to the figures reported in the 2023/24 IMR.
	Wastewater treatment emissions	10,943.19	9,884.02	The Mosgiel WWTP emissions calculations used in the 2023/24 IMR had missing values for Sremoved (sludge removed), which resulted in emissions for this WWTP being overstated. Once the correct values for Sremoved were included for 2023/24, Mosgiel WWTP emissions decreased significantly from 1802tCO2e to 743tCO2e once the Sremoved values were included.
	Biomass	NA	178.85	Emissions from the use of biomass have retrospectively been added to the baseline year of 2018/19 as well as 2023/24. 2024/25 marks the first year of this emissions source being incorporated in reporting.
Category 2: Indirect emissions from imported energy	Electricity	2,108.55	2,577.31	Electricity emissions for the January to June 2024 portion of the 2023/24 financial year were recalculated once the electricity emissions factor for the 2024 calendar year was released by MfE, with the emissions per kWh in 2024 higher than in 2023 (as part of the 2025 emissions factor workbook). The 2023 electricity emissions factor was used when the 2023/24 IMR was completed as a proxy, as the 2024 emissions factor was not available at the time.
Category 4: Indirect emissions from products used by organisation	Major suppliers	5,098.58	5,111.92	Major suppliers emissions in 2023/24 are slightly higher than previously reported, due to the emissions associated with electricity used by major suppliers increasing once the 2024 MfE electricity emissions factor was released.
	Electricity T&D losses	154.24	196.01	Electricity emissions for the January to June 2024 portion of the 2023/24 financial year were recalculated once the electricity emissions factor for the 2024 calendar year was released by MfE, with the emissions per kWh in 2024

				higher than in 2023 (as part of the 2025 emissions factor workbook). The 2023 electricity emissions factor was used when the 2023/24 IMR was completed as a proxy, as the 2024 emissions factor was not available at the time.
Total DCC emissions (across all sources, many not shown here)		59,160.06	58,011.01	Total emissions for 2023/24 across DCC reduced by 1,149.05tCO2e following all of the above changes to the emissions calculations.