Greenhouse Gas Emissions Inventory

Christchurch City Council

Prepared by (lead author): Carey Graydon, Principal Advisor Climate Resilience - Christchurch City Council
Date: 13/02/2025

This report has been prepared in accordance with ISO 14064-1:2018 and is audited by Toitū Envirocare.

Verification Status - Level of Assurance: Reasonable and Limited

Measurement period: 01/07/2024 to 30/6/2025
Base year period: 01/07/2022 to 30/6/2023

Contents

Introduction

This report is the annual greenhouse gas (GHG) emissions inventory report for Christchurch City Council. The purpose of this report is to quantify the GHG emissions that can be attributed to Christchurch City Council's operations within the declared boundary and scope for the July 2024 to June 2025 period.

This report has been prepared in accordance with ISO 14064-1:2018.

1. Organisation Description

The Christchurch City Council is a New Zealand Territorial Authority. It provides a variety of public services in line with its responsibilities under the Local Government Act 2002. Key activities undertaken by the Christchurch City Council include water supply, wastewater collection and treatment, storm water management, solid waste management, provision of transportation infrastructure, street lighting, arts and cultural facilities, parks, recreation and community facilities, and the provision of regulatory services.

The Council acknowledges its operations can have a direct impact on the environment, and it considers climate impacts as part of its decision-making. The Council is committed to measuring, managing, and reducing its operational greenhouse gas emissions.

2. Statement of intent

This inventory forms part of the Council's commitment to measure and manage down its greenhouse gas emissions. The intended uses of this inventory are:

- To transparently record the Council's operational greenhouse gas emissions.
- To ensure compliance with the requirements of the ISO-14064:2018 greenhouse gas emissions reporting standard.
- To assist with emissions reduction planning for Council's operations.
- To monitor progress against our organisational target of 'being net carbon neutral by 2030' for our operations.

Intended users of this report include, but are not limited to:

- Council staff
- Council's Executive Leadership Team
- Council Elected Members
- Christchurch residents.

This inventory will be presented to the Mayor and Councillors and then published on the Council's website to ensure it is publicly available.

3. Person Responsible / Author

Carey Graydon – Principal Advisor, Climate Resilience, has responsibility for authoring this report. David Griffiths - Head of Strategic Policy and Resilience, reporting to John Higgins – GM, Strategy, Planning and Regulatory, is responsible for overseeing the Council's emission inventory monitoring and reduction performance, as well as reporting results to the Executive Leadership Team.

The Executive Leadership Team has collective responsibility for managing budgets and resourcing across the organisation to meet its greenhouse gas emissions targets. The Executive Leadership Team report progress annually to Elected Members.

The Climate Resilience Team provides advice to the organisation on emissions reduction and removals opportunities.

4. Reporting Period

Measurement period of this report: 01/07/2024 – 30/06/2025
Base year measurement period: 01/07/2022 – 30/06/2023
Frequency of reporting will be annual.

This base year period was selected because it represents the first year in which we had access to a materially complete set of data records for forming the inventory for the Toitū audit. The Local Government financial year was selected to best align to our financial reporting cycles.

The Council has previously reported emissions inventories under the CEMARS and carboNZero programme for the financial years 2015/16 – 2018/19. As the methodology changed significantly in the way we measure emissions from our wastewater treatment processing (our largest source of emissions), and a wider set of emissions were captured, it was determined that using the 2022/23 period as a base year for reporting and emissions reduction planning would be most appropriate.

5. Organisational boundary and consolidation approach

Organisational boundaries are set with reference to the methodology described in the ISO 14064-1:2018. The standard allows two distinct approaches to be used to consolidate GHG emissions: the equity share or control (either financial or operational) approaches.[1]

The Christchurch City Council uses the 'operational control' consolidation approach to defining its boundaries. The Council's emissions inventory applies to all business units in the Council itself, including those in the following Groups: Office of the Chief Executive, Strategy, Planning and Regulatory Services, Citizens and Community Services, City Infrastructure, Finance, Risk and Performance, and Corporate Services.

All Council owned and operated facilities are included in this scope. Council premises leased to third parties, such as cafes at Council's pools and libraries, are intended to be excluded from the scope. However, unless such premises have their own dedicated electricity supply (ICP), at this time Council's BraveGen ESP dashboard will include their electricity use together with that of the Council facility that the premises are part of, as they are unable to be separated at this stage.

Since the FY22-23 inventory, separate electricity use data has been gathered for the Ilex Café and the Kiosk in the Botanic Gardens, South Library Café, and for the stores located in the Christchurch Bus Interchange and Brighton Mall. The electricity used by these facilities has been excluded from this inventory.

Any third parties, including Council Controlled Organisations (CCO), Council Controlled Trading Organisations (CCTO), and related Trusts are excluded from the scope. CCOs, CCTOs and Trusts have their own sustainability policies and are responsible for reporting and managing their own emissions.

Table 1. below shows an overview of those companies and trusts.[2]
Table 2. below provides an overview of Council Groups and key services and activities they provide.

[1] Control: the organisation accounts for all GHG emissions and/or removals from facilities over which it has financial or operational control. Equity share: the organisation accounts for its portion of GHG emissions and/or removals from respective facilities.

[2] Dormant subsidiaries such as CCHL (2), CCHL (4), CCHL (5), and Christchurch Networks Limited are shelf companies with no staff or ongoing operations, and zero associated GHG emissions, and are not shown in the table.

Table 1. Organisational boundary

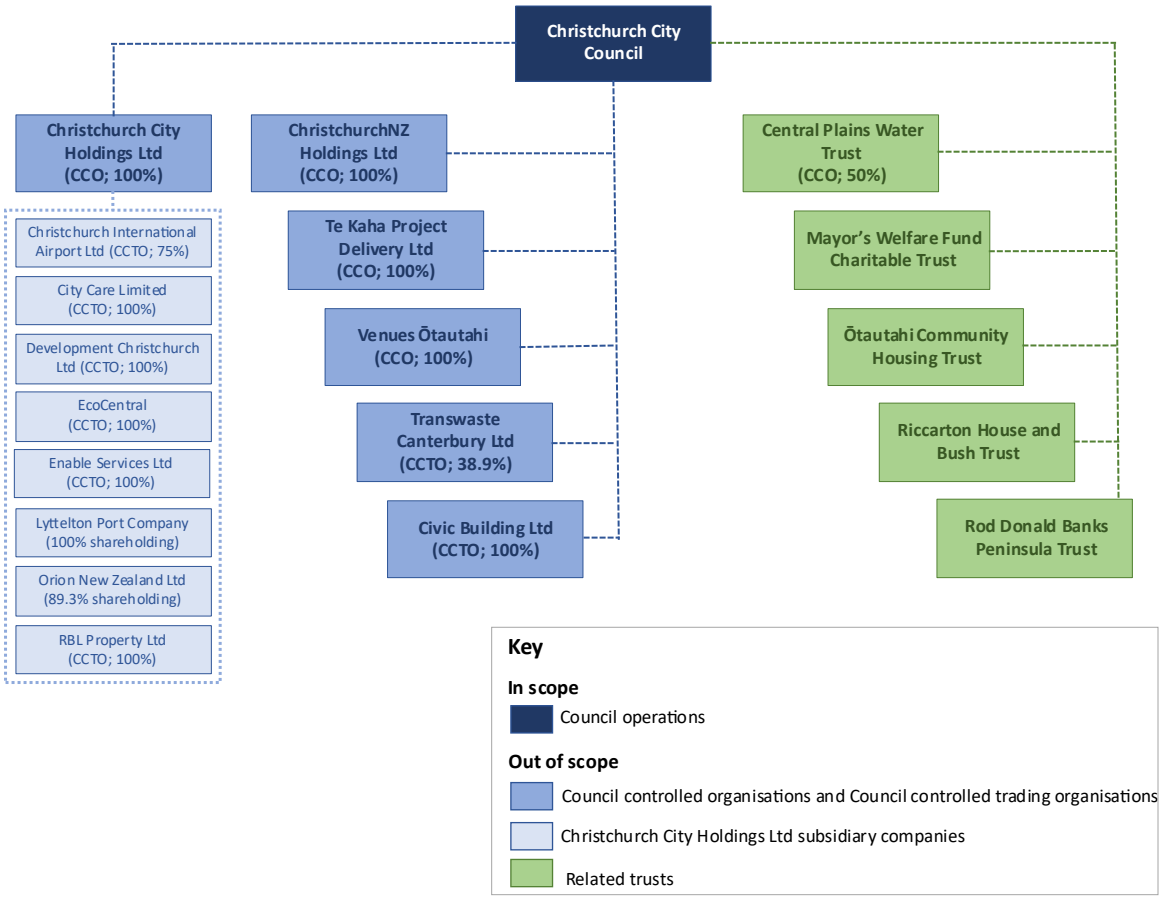

Table 2. Council Groups and key activities

Council Group	Unit	Key Functions and Activities
Office of the Chief Executive Group	Te Tiriti Partnerships, Legal & Democratic Services, Office of Mayor & Civic Services, Communications & Engagement	Mana whenua and Te Tiriti relationships, Administrative support, Council and committee support, Advisors to CE and Mayor, Democratic services, Legal services, LGOIMA/official information requests, Civic & international relations, Media response and advice, Marketing, Community engagement, Public and internal communications.

Council Group	Unit	Key Functions and Activities
Strategy, Planning and Regulatory Services Group	Building Consenting, Planning & Consents, Regulatory Compliance, Strategic Policy & Resilience, Greater Christchurch Partnerships.	Residential and commercial building consents and inspections, Code compliance with building consent conditions, LIMs and PIMs, Climate change policy development and advice, Strategic asset management planning & advice, Policy and strategy development and advice, and Bylaw reviews, Planning and Strategic Transport, Resource Consents, RMA Compliance, Case Management & Relationships, Heritage, Urban Design, Climate Hazards Adaptation Planning, Development Support/Business Support, Alcohol licensing, Animal management, Customer services and triage, Compliance and investigations, Food safety and environmental health.
Citizens and Community Services Group	Art Gallery, Citizen & Customer Services, Parks, Recreation, Sports & Events, Vertical Capital Delivery, Libraries & Information, Community Support & Partnerships.	Christchurch Art Gallery and Akaroa Museum, Customer services, including Call centre, Walk-in customer services, payments etc., Regional and community park operations-planting & maintenance, Biodiversity, Botanic Gardens, Hagley Park planning, operations and maintenance, Nursery planning and operations, Sports facilities planning, operations & maintenance, Sports programmes, Tūranga (central Library) and community libraries, Community board governance support, Community development and engagement, Community partnerships and funding, Civil defence & emergency management.
City Infrastructure Group	Three Waters. Transport & Waste, Technical Services & Design, Programme Management Office.	Transport policy & planning, Environmental health officers, Animal control, Land surveying, Road transport design, Architectural design, structural engineering, Geotechnical and natural hazards advice, Water supply planning and delivery, Wastewater planning and delivery, Wastewater treatment plant operations, Stormwater and flood management, Freshwater ecology – water quality and ecology monitoring and reporting, Water investigations and advice, including backflow prevention and trade waste, Transport asset planning, Roading projects management, maintenance renewals, Contract management for Kerbside waste collection, Recycling, Transfer stations, and Organics processing. Monitoring Burwood landfill and closed landfills, Waste minimisation projects.
Finance, Risk and Performance Group	Finance, Procurement & Contracts, Risk & Assurance, Corporate Planning & Performance.	Internal corporate services, Corporate financial planning, Accounting, CCO performance monitoring and reporting, Procurement and contract support, Health, safety & wellbeing, Risk and assurance, Research & monitoring, Long Term Plan, Annual Plan processes.

Council Group	Unit	Key Functions and Activities
Corporate Services Group	Digital/CIO, Innovation & Improvement, Facilities & Property, Business Support, People & Capability.	IT, Cyber security, Facilities planning, Contract management including facilities maintenance and repairs, Facilities operations, Business support, Continuous improvement, Smart Christchurch project management, Human resources, Organisation development, Recruitment.

The Unit list is correct at the time of this report. Key functions and activities may move between units, however they are unlikely to change significantly.

Excluded emissions sources

Emissions from activities on land and properties leased from Council, including grazing on Council land, are currently excluded from scope. Steps are underway to ensure that data is collected on grazing numbers so this can be included in future inventories.

For this inventory, stationary lubricant data has only been collected for two of our largest facilities, the Christchurch Wastewater Treatment Plant, and the Civic building. We have not counted any chemicals or fertilisers used in our parks in this inventory but are taking steps to collect this information for future inventories.

This inventory excludes water supply consumption and the usage of wastewater services under Category 4. This is to avoid double counting of the emissions that are produced by Council, and therefore included in Category 1 and 2. Christchurch City Council has confirmed that it will retain direct control of drinking water, wastewater, and stormwater services, deciding on an In-House Delivery Model. This means water service delivery associated greenhouse gas emissions will still be considered within the reporting boundary.

The only freight transportation included in this inventory is the supply of water (via contracted water tankers) in the case of supply disruption. All other sources of freight are excluded as we do not have sufficient information currently available, and as it is undertaken by third parties it falls outside the organisational boundary. Emissions from this source are also likely to be small compared to Council's total emissions.

The emissions associated with chemical production are excluded from this inventory. Chemicals, such as chlorine, are produced by third parties, and fall outside of the Council's organisational boundary. The emissions associated with the application of fertiliser are excluded as we have limited data at this time. The emissions associated with purchased goods and services and capital goods are also excluded as we have insufficient data at this time to accurately categorise them to be able to apply appropriate emission factors.

Table 3. Summary of excluded emission sources

Excluded emissions	GHG emissions ISO category	Rationale
Fertiliser application	Category 1	Insufficient data. This is being investigated for inclusion in future inventories.
Freight transport (other than from water tankers for water supply)	Category 3	We currently do not hold comprehensive data outside of water tankers for water supply. Data could potentially be collected in $ spent, but tkm was not readily available. Given the likely small impact on the total emissions, we have chosen to exclude other freight on a de minimis basis.
Purchased goods and services, including capital goods	Category 4	Insufficient data at this time to accurately categorise and apply appropriate emission factors.
Water supply and wastewater services (category 4)	Category 4	We have excluded this source from Category 4 (aside from water tanker delivery) as the Council directly supplies these services for the community and already accounts for those emissions in Category 1 and 2.
Chemical production	Category 4	We do not hold comprehensive data for this emissions source. Chemicals such as chlorine are produced by third parties and fall outside of the Council's organisational boundary.
Agricultural leases	Category 5	We do not have sufficient data to estimate emissions from agricultural leases.
Leased out Council owned properties and land	Category 5	Insufficient data. We are unaware of any significant sources from leased properties when compared to Council's total inventory.

Refrigerant liability

We are continuing to collect information to estimate our refrigerant liability across Council facilities. As this is in its early stages, the data is being collated into a spreadsheet and has not yet been entered into BraveGen (noting that liabilities data will not impact on actual annual emissions totals). We aim to incorporate available liability data in future reporting. However, emissions from refrigerants used in Council operations have been included in the inventory report where available.

Gross emissions

This report focuses on the Council's gross emissions only. Removals are not reported in this year's inventory. The Council intends to report on net emissions in future years. A policy to account for direct removals from Council owned and controlled trees has been developed and is in the data

collection phase. This will enable us to measure progress against our organisational goal of being net carbon neutral for our operations by 2030.

Reporting Boundaries

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

To identify emissions sources from Council activities, Council staff used the previous list of sources collected for its Resource Efficiency Greenhouse Gas Emissions (REGGE) data and prior emissions inventories as a starting point, and reviewed asset data to ensure all Council facilities and sites were included. Finance staff assisted with identifying invoices from relevant suppliers, which could be used to identify emissions sources.

Staff also held discussions with teams across Council to sense check the existing data sources, consider any new Council activities or delivery methods which may have any potential new sources, and then determine which additional sources should be included in this inventory. Facilities staff with expertise in energy management also assisted with identifying potential sources. For the FY22-23 inventory, Council staff also received guidance from BraveGen ESP staff (who have expertise in carbon inventories and are supplying our emissions inventory software), to ensure the Council was collecting sufficient sources of emissions data to comply with the ISO 14064-1:2018 standard.

As Three Waters is such a large component of the Council's overall emissions, a greater focus has been applied to that area. The Three Waters Unit has a position focused on climate resilience, and was able to provide advice on the wastewater treatment processes and emissions and additional related sources such as overflow estimates, allowing for a comprehensive view of Three Waters data.

The emissions sources deemed significant for inclusion in this inventory were classified into the following categories, as defined under ISO14064-1:2018:

- 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.
- Limited sources of indirect GHG emissions (Categories 3-4): GHG emissions that occur as a consequence of the activities of the company, but occur from sources not owned or controlled by the company.

No emissions sources were identified in Category 5 (indirect emissions associated with the use of products from the organisation), or Category 6 (indirect emissions (other sources)) as these fall outside the organisational boundary.

Methodology

Quantification approaches

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 those provided by the Ministry for the Environment, the United Kingdom Government or based on Intergovernmental Panel on Climate Change (IPCC), or Water New Zealand (Water NZ) guidance. The intent has been to use the most specific and relevant factor for the activity type being quantified.

IPCC's 'AR5 no climate-carbon feedback' factors were used in this year's inventory, unless otherwise stated[3].

Global Warming Potential (GWP) values used for the inventory

When compiling this inventory, the Council primarily used the emissions factors built into the BraveGen platform. This system multiplied the tonnes of various GHG emissions entered with the corresponding emissions factors for the relevant Global Warming Potential - to provide total emissions in a carbon dioxide equivalent (CO2-e), unless otherwise specified. The emissions factors used for each type of emission are listed in the Council's BraveGen ESP platform. The emissions factors used are from the Ministry for the Environment's Measuring emissions guide 2025[4] and are based on the IPCC guidance unless otherwise stated. For various categories of Recycled Waste, BraveGen ESP use the United Kingdom Government's Conversion Factors 2025 [5]. See Appendix A for a full list of emissions factors used in this inventory.

Wastewater methodology

One notable exception to the general emissions calculation methodology is the estimation of emissions from 'Wastewater Treatment (and network overflows)'. These emissions were estimated

[3] This aligns with the latest guidance from Ministry for the Environment, contained in the Measuring Emissions Detailed Guide: 2024, that uses the Global Warming Potentials from the IPCC, 2014, Fifth Assessment Report. 'Measuring Emissions: A guide for organisations: 2024 Detailed Guide'. | Ministry for the Environment. Overview of changes since previous update.

[4] Measuring emissions guide 2025 | Ministry for the Environment. 2025 Emissions Factor Workbook, Ministry for the Environment https://environment.govt.nz/assets/publications/Measuring-Emissions-Guide-2025/EmissionFactors_Workbook_2025_2.xlsx

[5] Greenhouse gas reporting: conversion factors 2025 - GOV.UK

based on calculations and emission factors from the Water New Zealand 'Carbon accounting guidelines for wastewater treatment: CH4 and N2O' (August 2021, referred to as the Water NZ Guidelines)[6]. The 'Measuring emissions: A guide for organisations: 2024 summary of emission factors' from the Ministry for the Environment recommends using the Water NZ Guidelines for calculations. For consistency with our other emission factors, we have chosen to apply the Intergovernmental Panel on Climate Change's 'AR5 no climate-carbon feedback' global warming potential factors in this year's inventory.

Calculations for the Christchurch Wastewater Treatment Plant (CWTP) (the largest wastewater treatment plant) were based on plant specific sampling and operational data where available. A simplified approach was taken for the much smaller Banks Peninsula wastewater treatment plants. Emissions have been calculated individually for each of the Wainui, Duvauchelle, Akaroa, and Tikao Bay plants by using population-based assumptions, as site specific data is not available at the same granularity as at the CWTP. Additionally, emissions associated with wastewater network overflows were estimated using equations adopted from the Water NZ Guidelines.

The population assumptions used for Banks Peninsula wastewater treatment plants were estimated by using an approximation of the population serviced by each wastewater treatment plant, based on the number of connections. After the inventory was submitted for verification, Council staff finalised a revised methodology to assign population figures to those Banks Peninsula plants. As the impact of the revised population methodology was only 0.005% of all reported wastewater treatment (and network overflows), a decision was made not to use the new figures and amend the inventory totals for this year. However, we intend to use the updated methodology next year subject to audit.

Staff commuting and working from home

Staff commuting emissions were estimated based on data gathered in a travel survey undertaken in May 2025. The survey was sent to all Council staff across all business units and facilities, including Councillors. The response rate for the survey was 45% of year end full-time equivalent staff. The survey data was then used to estimate commuting emissions from the entire Council workforce by scaling up the results on a proportional basis. An assumption was made that staff worked 45.6 weeks a year (assuming 4 weeks annual leave and public holidays).

Staff commuting emissions were calculated by multiplying the total distance travelled by each mode, with the relevant emissions factor for each mode to provide totals by mode. These were then added together to provide the total emissions.

The selected modes were chosen where possible to align with Ministry for the Environment 'default emission factors' for different vehicle types (e.g. petrol car, diesel car, petrol hybrid, electric vehicle, bus etc.). The '2015-2020 fleet' figures were used to estimate motorcycle emissions as there was no single default factor provided, and the 'petrol hybrid' default factor was

[6] Carbon accounting guidelines for wastewater treatment: CH4 and N2O | Water New Zealand. Emission Factors.

selected for taxi / uber travel. Active modes such as walking / jogging, cycling and scootering / skateboarding were assumed to have an emissions factor of zero, as were e-bikes and e-scooters (as the Ministry does not publish factors for them and indications are that they would be non-material compared to other modes).

This inventory also includes emissions data from staff working from home. This data was collected for the first time as part of the staff commuting survey (above) and the data was scaled up in the same way to cover results for non-respondents. The number of working from home days was multiplied by the default Ministry for the Environment emissions factor, then scaled up proportionally to cover all staff. The number of working days for full time equivalent staff was assumed to be 228 days, or 45.6 weeks (assuming 4 weeks annual leave and public holidays and anniversary days).

This data represents our best efforts to estimate emissions from staff commuting and working from home, but due to the wide range of roles and employment types at the Council, and potential seasonal variations, there is a level of uncertainty around the data.

Refrigerants

The refrigerant losses data recorded is the total amount of various refrigerants purchased for the Council by our suppliers. Refrigerant liability is mapped by facility. There are still limitations to the data for Three Waters refrigerant losses and liabilities. Work is underway to create a register of Three Waters heat pumps. Once updated, this information will be included in future inventories.

Information management procedures

The Council uses BraveGen ESP as its primary platform to hold its emissions information. Related procedure documents are kept in the Council's electronic document and records management system (TRIM) to ensure staff have access to the information. This level of data management enables the Council and individual units to make more informed emissions reduction decisions.

The emissions data is manually entered into the BraveGen ESP system, and the original invoices or spreadsheets are also stored in the system. Some parts of this process may become more automated in the future if suppliers are able to supply the invoices or data in a compatible form to be automatically uploaded.

Changes since previous inventory

There have been some minor changes to the methodology to ensure that the inventory better reflects the Council's organisational emissions activities.

This inventory includes emissions from staff travel and working from home for the first time. Previously, this data was not available. A travel survey was undertaken in May to provide an

estimate of staff commuting emissions and working from home emissions – see full details in the methodology section above.

Previously rental car data was estimated on assumed daily usage rates, but this year we are using volumes of CO2-e provided by our travel provider Orbit World Travel.

This inventory includes emissions associated with Parks maintenance for the first time. Previously, Parks maintenance was performed by contractors, and was therefore outside the reporting boundary of the inventory. This contract expired in June 2024, and Council decided to bring the Parks maintenance service entirely in house from 1 July 2024, meaning emissions from Parks maintenance now lie within the inventory boundary. This includes emissions from electricity use at new Parks depots, as well as fuel and electricity use for a number of new Parks vehicles and tools. An update has also been made where we have discovered diesel delivered to Hagley Park and Ngā Puna Wai Sports Hub, previously described as 'stationary' has been used for mowers and tractors, so is now reclassified as 'mobile' fuel where separation of usage is known.

This inventory also includes emissions associated with diesel exhaust fluid (DEF) for the first time. AdBlue can be used in diesel vehicles with Selective Catalytic Reduction technology to reduce emissions of nitrous oxides (NOx), however the use of AdBlue slightly increases the carbon footprint of the fuels consumed by the vehicles using it and is reported as a Category 1 emission this year. The emission factor used for AdBlue was provided by Toitū Envirocare Emission Factor Information Paper – Adblue (2022).

Energy generated by wood pellets has been removed from this year's inventory, as the Council no longer uses energy from wood pellets in its facilities.

As we now have sufficient data on a source of biogenic CO_2, this has been included separately outside Categories 1-6 for the first time, as required by ISO 14064-1. See table 8.

Historical recalculations

Historical recalculations have been undertaken as part of this inventory. Base year (Financial Year 2022/23) emissions were recalculated by revising the impact of updated emissions factors and changes to methodologies. The decision to recalculate was made because two significant changes had occurred related to calculations for Landfill Gas and Electricity.

The Council does not operate landfills, so it does not report on any emissions associated with those activities. Under the category of 'Landfill Gas', the Council only reports on the volume of gas that has been captured and combusted to be used by the Council as fuel energy or flared. In the base year calculations, the reporting of Landfill Gas was incorrectly treated as methane. The Ministry for the Environment guidance now advises that where methane is collected and flared or combusted for energy, the carbon dioxide emitted from the combustion process is regarded as part of the natural carbon cycle, and it is not provided with an emission factor as it has no net

effect on greenhouse gases[7]. Following that guidance, the previously reported volume of emissions from Landfill Gas in Categories 1-6 of the base year inventory has been changed to zero. This resulted in a reduction of 3,336.29 t CO2-e from the original base year inventory.

The other source with a notable change is electricity, due to a change in the emission factor for the 2022/23 period which was subsequently updated in the Ministry for the Environment's Measuring emissions guide 2025. Applying the revised emission factors to the electricity usage data resulted in an increase of 1,165.38 t CO2-e. There was also a decrease of 123.5 t CO2-e for Electricity, Transmission & Distribution Losses.

This has resulted in a revised total of 31,432.62 t CO2-e for Financial Year 2022/23. This is an overall reduction of 2,294.4 tCO2-e from the originally verified total of 33,727.04 t CO2-e. These results appear in Table 5 below. The auditors verified the changes to the base year inventory (and did not reverify the entire inventory).

An organisational recalculation procedure is being developed to guide when and how recalculations should be made in the future.

Data selection and collection, including assumptions and uncertainties

This inventory represents the Council's best efforts to estimate its greenhouse gas emissions. However, there is a level of uncertainty inherent in all reporting of greenhouse gas emissions. Emissions are not directly measured – instead they have been estimated via calculations using specific activity data (such as quantity and type of fuel used) with published emissions factors for each activity type, to provide a total quantity of emissions. These are presented as an amount of carbon dioxide equivalent (CO2-e), with the results dependent on that data quality.

In general, when preparing its greenhouse gas emission inventories, the Council assumes all supplier data provided is complete and accurate (for example, volumes of fuel or quantity of electricity purchased), and that the published emissions factors are correct, and that 'default' emissions factors are acceptable in the absence of more local or site-specific emission factors. Wastewater treatment emissions likely have greater uncertainty than most other sources, as the calculations require a number of assumptions, inputs, and use of default factors. Assumptions are outlined in table 4 below.

[7] Ministry for the Environment, 2024. Measuring-emissions_Detailed-guide_2024_ME1829.pdf

Table 4. Data collection methodology and assumptions for included emission sources.

GHG emissions category (ISO 14064-1:2018)	**GHG emissions source subcategory**	**Overview of Activity source data**	**Explanation of uncertainties or assumptions around data and evidence**	**Use of default and average emissions factors**
***Category 1*:** *Direct emissions and removals*	Direct emissions from stationary combustion	-Diesel (stationary) -Stationary LPG -Landfill gas -Lubricants stationary engines	It is assumed the data sources are complete and accurate. All source data is derived from supplier records.	The most accurate emissions factors were selected for all sources.
	Direct emissions from mobile combustion	-Fleet Fuel – Diesel -Fleet Fuel – Petrol -Fleet Fuel - AdBlue -Fleet lubricants	It is assumed the data sources are complete and accurate. All source data is derived from supplier records.	The most accurate emissions factors were selected for all sources.
	Wastewater treatment and network overflows emissions	-Wastewater treatment -Wastewater network overflows	Calculations are based on figures and methods in the Water NZ guidelines. Plant specific data was used where available.	Plant specific loading data was used for the Christchurch Wastewater Treatment Plant where available. Banks Peninsula loading data was instead based on population estimates and assumed average values. Both methods utilise emission factor values and equations from the Water NZ Guidelines where more specific local or site specific information was not available.
	Direct fugitive emissions arising from the release of GHGs in anthropogenic systems	-Refrigerants (heating and cooling)	It is assumed the data sources are complete and accurate. All source data is derived from maintenance records.	The most accurate emissions factors were selected for all sources, as all refrigerant types are directly correlated to the available GWP of the gas type.
	Direct emissions and removals from land use, land use change and forestry	-Fertiliser -Land use change / forestry	We have not collected data on fertiliser use, however this is being investigated for inclusion in future inventories. No significant land use change has occurred.	n/a
Overall assessment of	Medium. There is high confidence in data from stationary and mobile fuel use, but there is greater uncertainty around refrigerants, lubricants, and fertilisers. Wastewater calculations			

uncertainty for category 1	have a higher degree of uncertainty due to the range in the default factors used in combination with the calculation inputs, and the number of assumptions required.			
GHG emissions category	**GHG emissions source or sink subcategory**	**Overview of Activity data and evidence**	**Explanation of uncertainties or assumptions around data and evidence**	**Use of default and average emissions factors**
Category 2: *Indirect GHG emissions from imported energy*	Indirect emissions from imported electricity	-Electricity -Energy generated by woodchips. (The burning of the woodchips produces process heat used in the Christchurch Wastewater Treatment Plant operations. Indirect emissions from imported energy are reported in category 2 as per ISO 14064-1 - appendix B.3.2.)	It is assumed the data sources are complete and accurate. All source data is derived from supplier records.	Average emissions factors were used for electricity, and default emissions factors were used for energy generated by woodchips. (Note that the biogenic CO_2 from wood chips is reported separately outside category 1-6.)
Overall assessment of uncertainty for Category 2 emissions	Medium. There is high confidence that the quantity of imported energy is correct.			
GHG emissions category	**GHG emissions source or sink subcategory**	**Overview of Activity data and evidence**	**Explanation of uncertainties or assumptions around data and evidence**	**Use of default and average emissions factors**
Category 3*: Indirect GHG emissions from transportation*	Emissions from Business travel	-Air travel (domestic, long and short haul, business/economy), -Hotels -Rental cars -Private cars -Taxis	It is assumed the data sources are complete and accurate. All source data is derived from supplier customer activity reports.	The most accurate emissions factors were selected from the available data – e.g., air travel split by type of flight and class, hotels by country etc.
	Emissions from upstream transport and distribution for goods	-Freight transport	We currently do not hold comprehensive data outside of water tankers for water supply. Freight is undertaken by third parties and it falls outside of our organisational boundary. It also likely has a small impact on	The most accurate emissions factors were selected from the available data.

			total emissions, and is not included in this inventory.	
	Emissions from staff commute	Staff transport to and from work	Data is derived from an all-of-staff travel survey, including Councillors. The response rate for the survey was 45% of full-time equivalent staff, and this data was used to estimate emissions from the entire Council workforce. When estimating these emissions, it was assumed that the data collected was representative of all Council staff across all facilities and business units.	Emissions factors were selected from the available data to ensure an appropriate balance of accuracy/survey usability and response rate. They include: - All default private car type emission factors.[8] - All motorcycle emissions factors for vehicles produced 2015-2020.[9] - The national average bus emissions factor.[10]
	Staff working from home	Staff working from home energy use	Data is derived from an all-of-staff travel survey, including Councillors. The response rate for the survey was 45% of full-time equivalent staff, and this data was extrapolated to estimate emissions from the entire Council workforce. It is assumed that this data is representative of all Council staff across all facilities and business units.	The 'default' working from home emission factor was selected as most accurate for the available data.
Overall assessment of uncertainty for	Medium/High. Some uncertainty around staff business travel (e.g. size of rental cars, hotel averages etc.) and freight. There is greater uncertainty on staff commuting and working from home data, as assumptions had to be made that the results of respondents would reflect the results of staff who had not completed the survey.			

[8] Measuring emissions guide 2025 | Ministry for the Environment *Emission Factors Workbook 2025* (Default emissions factors – Private car default - petrol diesel, petrol hybrid, diesel hybrid, PHEV (petrol/electricity, diesel/electricity) Electric).

[9] Measuring emissions guide 2025 | Ministry for the Environment *Emission Factors Workbook 2025* (2015-2020 Fleet, Motorcycle).

[10] Measuring emissions guide 2025 | Ministry for the Environment *Emission Factors Workbook 2025* (Public transport passenger travel emissions factors – Bus, National Average for Bus).

Category 3 emissions				
GHG emissions category	**GHG emissions source or sink subcategory**	**Overview of Activity data and evidence**	**Explanation of uncertainties or assumptions around data and evidence**	**Use of default and average emissions factors**
Category 4: *Indirect GHG emissions from products used by an organisation*	Transmission and distribution losses	-Electricity - Transmission and Distribution Losses	It is assumed the data sources are complete and accurate. All source data is derived from supplier customer activity reports.	Average T&D factors used
	Materials and Waste	-Waste to landfill -Recycled waste	Local MfE factors used for landfill waste, some uncertainty around using UK based recycling factors.	DEFRA factors used for various categories of recycling
	Biosolid disposal to land application	- Biosolids disposal to land application	Calculations are based on figures and methods in the Water NZ guidelines. Biosolids amounts were based on invoice data.	Estimations utilise emission factor values and equations from the Water NZ Guidelines where more specific local or site-specific information was not available.
Overall assessment of uncertainty for Category 4 emissions	Medium. Good information on Transmission and Distribution Losses. There is confidence in the accuracy of the volumes of various types of recycling, but some uncertainty around accuracy of recycling factors. There is a higher degree of uncertainty for biosolids application to land due to the range in the default factors used and the number of assumptions required.			
Category 5: *Indirect emissions associated with the use of products from the organisation*	Out of scope			
Category 6*: Indirect emissions (other sources)*	Out of scope			

EMISSIONS INVENTORY RESULTS

Inventory Summary

Table 5. GHG emissions summary for period 01 July 2024 to 30 June 2025, with recalculated baseline year 2022/23

Category	Previously reported base year total emissions (tCO2-e) 2022/23	Recalculated total emissions (tCO2-e) 2022/23[11]	Total emissions (tCO2-e) 2024/25
Category 1: Direct emissions	24,279.25	22,392.69	27,162.23
Category 2: Indirect emissions (*imported energy*)	5,413.60	6,578.98	8,617.39
Category 3: Indirect GHG emissions (*transportation*)	331.57	331.56	2,351.70
Category 4: Indirect emissions (*products used by organisation*)	3,702.62	2,129.40	2,534.23
Category 5: Indirect emissions (*use of products from the organisation*)	n/a	n/a	n/a
Category 6: Indirect GHG emissions (*other sources*)	n/a	n/a	n/a
Total direct emissions	24,279.25	22,392.69	27,162.23
Total indirect emissions	9,447.79	9,039.94	13,503.32
Total gross emissions	**33,727.04**	**31,432.62**	**40,665.54**

[11] Rounding of individual categories means they do not add precisely to the total of 31,432.62 tCO2e.

Table 6. GHG emissions summary by source: 01 July 2024 to 30 June 2025

Category (ISO 14064-1:2018)	**Scope**	**Emission Source**	**Emissions** (tCO2-e)
Category 1: Direct emissions	1	Diesel (stationary)	940.02
		LPG (stationary)	56.28
		Lubricants	26.21
		Fleet Fuel - Diesel	1,106.08
		Fleet – AdBlue	0.29
		Fleet Fuel - Petrol	225.55
		Wastewater Treatment (and network overflows)	24,705.03
		Refrigerants	102.77
		Fertiliser	n/a
		Land use change / forestry	n/a
		Total Emissions CATEGORY 1	**27,162.23**
Category 2: Indirect emissions (*imported energy*)	2	Electricity	8,454.23
		Energy generated by wood chips	163.16
		Total Emissions CATEGORY 2	**8,617.39**
Category 3: Indirect GHG emissions (*transportation*)	3	Air Travel	176.23
		Hotels	8.83
		Rental Cars	7.57
		Private Cars	106.99
		Taxis	0.62
		Freight transport distribution	31.42
		Staff Commute	2002.2
		Staff working from home	17.84
		Total Emissions CATEGORY 3	**2,351.70**
	3	Electricity -T&D losses	642.96

Category 4: Indirect emissions (*products used by organisation)*			
		Waste to landfill	387.24
		Recycled waste	1.69
		Biosolid disposal to land application	1,502.33
		Total Emissions CATEGORY 4	**2,534.23**
Category 5: Indirect emissions associated with the use of products from the organisation	3	Out of scope	n/a
Category 6: Indirect emissions from other sources	3	Out of scope	n/a
		TOTAL EMISSIONS	**40,665.54**

Table 7. Direct Category 1 emissions by gas

Category 1 Emission source	Emissions by gas (converted to CO2-e)							
	CO2	CH4	N2O	HFCs	PFCs	SF6	other	Total (CO2-e)
Wastewater (treatment plant process & effluent, and network overflows)	-	10,452.1	14,253.0	-	-	-	-	24,705.0
Refrigerants	-	-	-	102.8	-	-	-	102.8
Fuel[12],[13]	2,321.8	8.2	24.2	-	-	-	0.3	2,354.4
Total Category 1	2,321.8	10,460.2	14,277.1	102.8	-	-	0.3	**27,162.2**

[12] Includes stationary lubricants burnt as fuel.
[13] Includes fleet lubricants.

Biogenic CO_2 Emissions

Biogenic CO_2 emissions are quantified in table 8 below. These emissions are part of a short-term carbon cycle where carbon is absorbed and then released by plants. As required by ISO 14064-1, they are quantified and reported separately from (or outside of) Categories 1 – 6 (shown in tables 5, 6 and 7). We currently only have data for biogenic CO_2 emissions from the burning of woodchips (which produces process heat used in operations at the Christchurch Wastewater Treatment Plant). For future inventories, the Council will continue to consider if we have data on other potential sources of biogenic CO_2.

Table 8. Biogenic CO_2

Biogenic CO_2 Emission Source	**Description**	**Total reported emissions outside Categories 1-6 (tCO_2e)**
Woodchips	Burning woodchips produces process heat used in the Christchurch Wastewater Treatment Plant. The biogenic CO_2 component produced from burning the woodchips is listed here (note this component is required to be reported separately to the other emissions produced from the burning of woodchips, e.g. methane, which are reported in Category 2).	4,965.62

Performance Monitoring

The Council will monitor its greenhouse gas emissions on an ongoing basis through its BraveGen ESP platform. The Council will report on its results annually, after verification has occurred.

Organisational emissions reduction planning is currently underway, with key reduction opportunities being identified for the organisation. Work has also begun to quantify removals so they can be included in future inventories, with the annual results compared against the Council's emissions targets.

Staff in key units across the Council will be responsible for identifying emissions reduction opportunities within their units, relevant to their activities.

Significance Criteria

The Council's intention is to include all available sources of emissions under Category 1 and 2.

When considering additional sources for inclusion in Category 3 and 4, key considerations were available data sources (e.g., what we could collect for the eligible period), the estimated magnitude of emissions (size of the source compared to organisational total), and the degree of influence the Council has on the emissions. As a public sector organisation, staff also reviewed guidance in the Carbon Neutral Government Programme (CNGP) on what should be considered a significant source for inclusion (noting this was to inform thinking only, and that Councils are not required to comply with that programme). In general, where information was readily available, we included it within scope if it aligned with our reporting boundary.

For example, staff business travel was included in Category 3 as the decision for that travel was made within the organisation, and we hold receipts for the different emissions sources involved, such as airfares, taxis, and hotels etc., and could reasonably influence those emissions by varying business travel policy. We also hold good information on waste and recycling across Council sites, so included that data under Category 4. Likewise, data on Transmission and Distribution Losses was readily available and included in scope. This year emissions from staff commuting and working from home were included as we have now collected the relevant data.

Insufficient data meant we excluded emissions from livestock on agricultural leases and land and properties leased from Council, fertiliser use, purchased goods and services including capital goods, and limited the reporting on freight.

See Table 9 below for a summary of the significance criteria used.

Table 9. Significance criteria

Emissions source	Likely magnitude of emissions (compared to overall inventory)	Data availability	Public sector guidance	Level of influence	Include in inventory ?	Key determinant for decision
Staff commute	Moderate	yes	If practicable	moderate	yes	Available data, moderate magnitude, moderate influence
Staff working from home	low	yes	If practicable	moderate	yes	Available data, moderate influence

Staff business travel	low	yes	yes	high	yes	Good data, high influence
T&D losses	moderate	yes	yes	low	yes	Good data, moderate magnitude
Freight transport	low	limited	If practicable	moderate	Yes, noting limited data is only available from water tankers	Limited data, but sufficient to include data from water tankers.
Agricultural Leases	moderate	no	If practicable	high	no	Insufficient data.
Leased out Council properties and land	unknown	no	If material and available data	moderate	no	Insufficient operational data from the third parties who lease from Council
Purchased goods and services, including capital goods	unknown	limited	If material and available data	moderate	no	Insufficient data to accurately categorise different types of purchased goods and services to calculate the emissions impact.
Waste and Recycling	moderate	yes	yes	high	yes	Available data, high influence.
Water Supply and Wastewater services (Category 4)	low	yes	yes	moderate	no	Double counting - if included. As Council supplies those services it already counts these in Category 1 & 2 (aside from water

						tanker supply)
Chemical production	unknown	limited / outside boundary	If practicable	low	no	Limited data availability, low influence, largely outside boundary
Fertiliser application	unknown	very limited	yes	high	no	Insufficient data. This is being investigated for inclusion in future inventories.

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.

Measuring emissions guide: 2025. Ministry for the Environment, New Zealand. Measuring emissions guide 2025 | Ministry for the Environment

Greenhouse gas reporting: conversion factors 2025. Department for Energy Security and Net Zero, United Kingdom. Greenhouse gas reporting: conversion factors 2025 - GOV.UK

Carbon accounting guidelines for wastewater treatment: CH4 and N2O. Water New Zealand (Water NZ Guidelines), 2021. Carbon accounting guidelines for wastewater treatment: CH4 and N2O | Water New Zealand

Emissions Factor Information Paper - AdBlue. Toitū Envirocare, 2022.

APPENDIX A: Emission Factors Used for Inventory effective from 01-07-2024 (Update with final factors used this year from BraveGen).

Emission Factor Group (EFG)	Resource Type (EFG)	Category (EFG)	UoM (EI	Region (EFG	Emission Factor Description	Factor tCO2e	Factor Source
AdBlue	Mobile Combustion	Fuel	t	New Zealand	Adblue	0.000259800000	Toitū Emission Factor Information Paper. March 2022.
Air Travel - Domestic Business (km) MFE	Air Travel - Domestic Business (km)	Business Travel	km	New Zealand	Air Travel - Domestic Business (km) with RF - National Av	0.000194283080	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Domestic air travel passenger. W/ Ra
Air Travel - Domestic Economy (km) MFE	Air Travel - Domestic Economy (km)	Business Travel	km	New Zealand	Air Travel - Domestic Economy (km) with RF - National Av	0.000194283080	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Domestic air travel passenger. W/ Ra
Air Travel - Domestic Premium Economy (km) MFE	Air Travel - Domestic Premium Economy (km)	Business Travel	km	New Zealand	Air Travel - Domestic Premium Economy (km) with RF - N	0.000194283080	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Domestic air travel passenger. W/ Ra
Air Travel - International Long Haul Business (km) MFE	Air Travel - International Long Haul Business (km)	Business Travel	km	New Zealand	Air Travel - International Long Haul Business (km) with RF	0.000428587630	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Air Travel - International Long Haul Economy (km) MFE	Air Travel - International Long Haul Economy (km	Business Travel	km	New Zealand	Air Travel - International Long Haul Economy (km) with R	0.000147790360	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Air Travel - International Long Haul Premium Economy (k	Air Travel - International Long Haul Premium Eco	Business Travel	km	New Zealand	Air Travel - International Long Haul Premium Economy (k	0.000236461640	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Air Travel - International Short Haul Business (km) MFE	Air Travel - International Short Haul Business (km	Business Travel	km	New Zealand	Air Travel - International Short Haul Business (km) with R	0.000226397170	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Air Travel - International Short Haul Economy (km) MFE	Air Travel - International Short Haul Economy (kn	Business Travel	km	New Zealand	Air Travel - International Short Haul Economy (km) with F	0.000150938150	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Air Travel - International Short Haul Premium Economy (	Air Travel - International Short Haul Premium Ecc	Business Travel	km	New Zealand	Air Travel - International Short Haul Premium Economy (k	0.000150938150	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. International Air Travel. W/ Radiative
Chlorine production - Chlorine Gas (kg)	Chemical production	Chemical productio	kg	New Zealand	Chlorine production - Chlorine Gas (kg) (EuroChlor)	0.000800000000	2022 EuroChlor Data – LCIA Results in 2022 Report (page 4 of PDF).
Chlorine production - Sodium Hypochlorite (kg)	Chemical production	Chemical productio	kg	New Zealand	Chlorine production - Sodium Hypochlorite (kg) (EuroChl	0.000740000000	2022 EuroChlor Data – LCIA Results in 2022 Report (page 4 of PDF)
Diesel (L) MFE	Diesel (L)	Fuel	L	New Zealand	Diesel (L)	0.002680680606	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Transport fuels (sum of gases used)
Diesel stationary (L) MFE	Diesel stationary (L)	Fuel	L	New Zealand	Diesel stationary (L)	0.002679858469	MfE Measuring Emissions Guidance Workbook. May 2025. Stationary Combustion Fuel. Commercial Use
Electricity (kWh) MFE	Electricity (kWh)	Electricity	kWh	New Zealand	Electricity (kWh)	0.000101118950	MfE Measuring Emissions Guidance Workbook. May 2025. Purchased energy. Purchased energy - Annua
Electricity T&D Losses (kWh) MFE	Electricity T&D Losses (kWh)	Electricity	kWh	New Zealand	Electricity T&D Losses (kWh)	0.000007690300	MfE Measuring Emissions Guidance Workbook. May 2025. T&D losses. Electricity Transmission and distr
Hotel Stay - AU (room night) MFE	Hotel Stay - AU (room night)	Business Travel	room night	New Zealand	Hotel Stay - AU (room night)	0.034119415830	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - CN (room night) MFE	Hotel Stay - CN (room night)	Business Travel	room night	New Zealand	Hotel Stay - CN (room night)	0.058306251000	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - GB (room night) MFE	Hotel Stay - GB (room night)	Business Travel	room night	New Zealand	Hotel Stay - GB (room night)	0.010378755410	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - IT (room night) MFE	Hotel Stay - IT (room night)	Business Travel	room night	New Zealand	Hotel Stay - IT (room night)	0.015333210000	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - JP (room night) MFE	Hotel Stay - JP (room night)	Business Travel	room night	New Zealand	Hotel Stay - JP (room night)	0.037397162780	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - NZ (room night) MFE	Hotel Stay - NZ (room night)	Business Travel	room night	New Zealand	Hotel Stay - NZ (room night)	0.010307849120	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - SG (room night) MFE	Hotel Stay - SG (room night)	Business Travel	room night	New Zealand	Hotel Stay - SG (room night)	0.023305414110	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - SK (room night) MFE	Hotel Stay - SK (room night)	Business Travel	room night	New Zealand	Hotel Stay - SK (room night)	0.045619966560	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - UAE (room night) MFE	Hotel Stay - UAE (room night)	Business Travel	room night	New Zealand	Hotel Stay - UAE (room night)	0.054724472830	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Hotel Stay - US (room night) MFE	Hotel Stay - US (room night)	Business Travel	room night	New Zealand	Hotel Stay - US (room night)	0.014239889370	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Hotel Stays
Landfill gas (m3)	Landfill Gas	Landfill Gas	m3	UK	Landfill Gas (m3) (UKBEIS)	0.000324086400	UK Government GHG Conversion Factors for Company Reporting. 2025 Flat file V1.0 Bioenergy. Biogas. L
Landfill Waste - Bio Sludge (t) MFE	Landfill Waste - Bio Sludge (t)	Waste	t	New Zealand	Landfill Waste - Bio Sludge (t) - Waste (known compositic	0.134400000000	MfE Measuring Emissions Guidance Workbook. May 2025. Waste. Waste to landfill with gas recovery
Landfill Waste - Contaminated Recycling (t) DEFRA	Landfill Waste - Contaminated Recycling (t)	Waste	t	UK	Landfill Waste - Contaminated Recycling (t) - Waste Dispo	0.520532700000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Refuse. Comr
Landfill Waste - General Mixed Commercial (t) MFE	Landfill Waste - General Mixed Commercial (t)	Waste	t	New Zealand	Landfill Waste - General Mixed Commercial (t) with LFGR	0.203308400000	MfE Measuring Emissions Guidance Workbook. May 2025. Waste. Waste to landfill with gas recovery
LFG as Energy	Fuel	Fuel		NZ		0.000000000000	
LPG (kg) MFE	LPG (kg)	Fuel	kg	New Zealand	Stationary Fuel Industrial Use - LPG - kg (MFE)	0.002966315097	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Stationary Combustion Fuel. Industrial
LPG (t) MFE	LPG (t)	Fuel	t	New Zealand	Stationary Fuel Industrial Use - LPG - t (MFE)	2.966315097000	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Stationary Combustion Fuel. Industrial
Non-emission (None)	Non-emission (None)	Non-emission	None	None	Non-emission (None)	0.000000000000	No Source, Place holder for zero usage inventory or out of scope inventory
Petrol Premium (L) MFE	Petrol Premium (L)	Fuel	L	New Zealand	Petrol Premium (L)	0.002422697311	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Transport fuels (sum of gases used)
Petrol Unleaded (L) MFE	Petrol Unleaded (L)	Fuel	L	New Zealand	Petrol Unleaded (L)	0.002383126923	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Transport fuels (regular) (sum of gases
Private car mileage (km) MFE (Average private car - petro	Private car mileage (km)	Business Travel	km	New Zealand	Private car mileage (km) MFE (Private Car - Average - Petr	0.000244368460	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Car Default Emission Factors (sum of
Recycled Waste - Cardboard (t) DEFRA	Recycled Waste - Cardboard (t)	Waste	t	UK	Recycled Waste - Cardboard (t) Paper and board: board -	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Paper. Paper
Recycled Waste - Comingle Materials (t) DEFRA	Recycled Waste - Comingle Materials (t)	Waste	t	UK	Recycled Waste - Comingle Materials (t) Most common re	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Paper. Paper
Recycled Waste - Food Waste (t) DEFRA	Recycled Waste - Food Waste (t)	Waste	t	UK	Recycled Waste - Food Waste (t) Organic: food an drink w	0.008983110000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Refuse. Orgar
Recycled Waste - Glass Mixed (t) DEFRA	Recycled Waste - Glass Mixed (t)	Waste	t	UK	Recycled Waste - Glass Mixed (t) Glass - Open-loop	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Other. Glass
Recycled Waste - Green Waste (t) DEFRA	Recycled Waste - Green Waste (t)	Waste	t	UK	Recycled Waste - Green Waste (t) - Organic: mixed food a	0.008983110000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Refuse. Orgar
Recycled Waste - Paper & Cardboard (t) DEFRA	Recycled Waste - Paper & Cardboard (t)	Waste	t	UK	Recycled Waste - Paper & Cardboard (t) Paper and board	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Paper. Paper
Recycled Waste - Paper (t) DEFRA	Recycled Waste - Paper (t)	Waste	t	UK	Recycled Waste - Paper (t) Paper and board: paper - Clos	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Paper. Paper
Recycled Waste - Plastic (t) DEFRA	Recycled Waste - Plastic (t)	Waste	t	UK	Recycled Waste - Plastic (t) Plastics: average plastics - Clos	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Plastic. Plastic
Recycled Waste - Polystyrene (t) DEFRA	Recycled Waste - Polystyrene (t)	Waste	t	UK	Recycled Waste - Polystyrene (t) Plastics: PS (incl. forming	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Plastic. Plastic
Recycled Waste - Recycle Mixed Commercial (t) DEFRA	Recycled Waste - Recycle Mixed Commercial (t)	Waste	t	UK	Recycled Waste - Recycle Mixed Commercial (t) Most com	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Plastic. Plastic
Recycled Waste - Tyres & Rubber Products (t) DEFRA	Recycled Waste - Tyres & Rubber Products (t)	Waste	t	UK	Recycled Waste - Tyres (UK BEIS)	0.004685680000	UK Govt. June 2025. V1. GHG Conversion Factors for Company Reporting. Waste Disposal. Construction.
Refrigerant 134a (kg)	Refrigerant HFC 134a	Fugitive Emissions	kg	New Zealand	Refrigerant 134a (kg) - MFE	1.300000000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R22 (kg)	Refrigerant	Fugitive Emissions	kg	New Zealand	Refrigerant R22 (kg) - MFE	1.760000000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R32 (kg)	Refrigerant (kg)	Fugitive Emissions	kg	New Zealand	Refrigerant R32 (kg)	0.677000000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R407c (kg)	Refrigerant R407c	Fugitive Emissions	kg	New Zealand	Refrigerant R407c (kg) (MFE)	1.624210000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R410a (kg)	Refrigerant R410a	Fugitive Emissions	kg	New Zealand	Refrigerant R410a (kg) - MFE	1.923500000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R417a (kg)	Refrigerant R417a	Fugitive Emissions	Kg	New Zealand	Refrigerant R417a (kg) (MFE)	2.127322000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Refrigerant R744(kg)			kg			0.001000000000	MfE Measuring Emissions Guidance Workbook. May 2025. Refrigerants and other gases. Refrigerants ar
Rental Car - Compact (CO2 kg) MFE	Rental Car - Compact (CO2 kg)	Business Travel	CO2 kg)	New Zealand	We now have report with CO2 value provided so we use	0.001000000000	Orbit remit
Rental Car - Economy (CO2 kg) MFE	Rental Car - Economy (CO2 kg)	Business Travel	CO2 kg	New Zealand	We now have report with CO2 value provided so we use	0.001000000000	Orbit remit
Rental Car - Electric (km) MFE	Rental Car - Electric (km)	Business Travel	km	New Zealand	Rental Car - Electric (km) MFE	0.000022637540	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Car Default Emission Factors (sum of
Rental Car - Full Size (CO2 kg) MFE	Rental Car - Full Size (CO2 kg)	Business Travel	CO2 kg	New Zealand	We now have report with CO2 value provided so we use	0.001000000000	Orbit remit
Rental Car - Intermediate (CO2 kg) MFE	Rental Car - Intermediate (CO2 kg)	Business Travel	CO2 kg	New Zealand	We now have report with CO2 value provided so we use	0.001000000000	Orbit remit
Rental Car - Standard (CO2 kg)	Rental Car - Standard (CO2 kg)	Business Travel	CO2 kg	New Zealand	We now have report with CO2 value provided so we use	0.001000000000	Orbit remit
Road Freight - HGV Diesel >=30000kg	Road Freight	Road Freight	km	New Zealand	Road Freight - HGV Diesel >=30000kg (MFE) 2015-2020	0.001493943301	MfE Measuring Emissions Guidance Workbook. May 2025. Freight Transport. Road freight for heavy goo
Sea freight - container ship (tKm)	Freight	Freight	tKm	New Zealand	Container Ship Average	0.000016120000	MfE Measuring Emissions Guidance Workbook. May 2025. Freight Transport. Sea freight emission facto
Stationary Lubricants (L) MFE	Stationary Lubricants (L)	Fuel	L	New Zealand	Stationary Lubricants (L) MFE (Light Fuel Oil - industrial us	0.002963348406	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Stationary Combustion Fuel. Industrial
Taxis (km) MFE	Taxis (km)	Business Travel	km	New Zealand	Taxi usage (km) Taxi Travel Regular	0.000162262760	MfE Measuring Emissions Guidance Workbook. May 2025. Travel. Car Default Emission Factors
Tonnes CO2e	Tonnes CO2e	Tonnes CO2e	tCO2e	New Zealand	Tonnes CO2e	1.000000000000	tCO2e input, no source
Vehicle Lubricants (L) MFE	Vehicle Lubricants (L)	Fuel	L	New Zealand	Vehicle Lubricants (L) MFE (Light Fuel Oil - Transport Fuels	0.002981910743	MfE Measuring Emissions Guidance Workbook. May 2025. Fuel. Transport fuels (sum of gases used)
Wood Chip - Biogenic CO2 (GJ)	Wood chip	Wood chip	GJ	UK	Wood Chip - Biogenic CO2 (GJ) (UKBEIS)	0.097222300000	UK Government GHG Conversion Factors for Company Reporting. 2025 Flat file V1.0- outside Scopes: Co
Wood Chip (GJ)	Wood chip	Wood chip	GJ	UK	Wood Chip (GJ) (UKBEIS)	0.003194447000	UK Government GHG Conversion Factors for Company Reporting. 2025 Flat file V1.0 Bioenergy. Biomass
Wood Pellets - Biogenic CO2 (t) MFE	Wood Pellets - Biogenic CO2 (t)	Fuel	t	New Zealand	Wood Pellets (t) Wood - Industrial - Biogenic	1.698793066700	MfE Measuring Emissions Guidance. May 2025. Fuel. Biofuel & Biomass. Biomass - Manufacturing Use
Wood Pellets (t) MFE	Wood Pellets (t)	Fuel	t	New Zealand	Wood Pellets (t) Wood - Industrial	0.028861760000	MfE Measuring Emissions Guidance. May 2025. Fuel. Biofuel & Biomass. Biomass - Manufacturing Use