MEMORANDUM

TO:	**Environmental Sustainability Committee**
MEETING DATE:	**21 September 2022**
TITLE:	**PNCC Organisational Emissions Inventory 2020/21**
PRESENTED BY:	**Adam Jarvis, Senior Climate Change Advisor & David Watson, Climate Change Analyst**
APPROVED BY:	**David Murphy, Chief Planning Officer**

RECOMMENDATION TO ENVIRONMENTAL SUSTAINABILITY COMMITTEE

1. **That the Committee note that the results of the PNCC Organisational Emissions Inventory 2020/21, excluding transmission and distribution losses, are:**

   PNCC emissions have fallen from 26,444 tCO2e in 2015/16, to 19,297 tCO2e in 2020/21, a 27% reduction.

   Non-landfill related emissions fell from 6,834 tCO2e to 5,374 tCO2e over the same period, a 21.4% reduction overall, and a -5.9% reduction from the previous 2019/20 period.

1. ISSUE

Through the Eco City Strategy 2021, Palmerston North City Council has set itself the target of a citywide 30% reduction in carbon emissions by 2031, compared to a 2015/16 baseline. Council has been tracking progress towards its emission reduction goals since establishing this baseline, through the 'Toitū Carbonreduce' programme, previously known as Enviromark Carbon Emission Management and Reduction Scheme (CEMARS).

Unfortunately, the criteria for the 'Carbonreduce' programme are slightly different from those that Council has been following since 2015/16, requiring PNCC to include various emission sources that sit outside of Council's operational control, and making comparisons with prior years difficult. For clarity, the numbers quoted in this covering memo utilise the same methodology as previous years, while the numbers in the attached 'Inventory and Management Report' also include transmission and distribution (T&D) losses. Officers are reviewing Council's external audit contract with the expectation of resolving this issue, as well as substantially reducing cost and the current ~15-month delay between the end of a reporting period, and the delivery of the inventory report to elected members.

The results of the 2020/21 Inventory, excluding T&D losses, are:

- PNCC emissions have fallen from 26,444 tCO_2e in 2015/16, to 19,297 tCO_2e in 2020/21, a 27% reduction.

- Non-landfill related emissions fell from 6,834 tCO_2e to 5,374 tCO_2e over the same period, a 21.4% reduction overall, and a -5.9% reduction from the previous 2019/20 period.

Several emissions sources have been substantially affected by lockdowns and restrictions resulting from the COVID 19 pandemic. Many council operations deemed 'non-essential' during the lockdown period contributed significantly reduced emissions during those periods when those services were essentially non-operational. Some trends established during the lockdowns continued after the lockdowns were lifted, particularly workplace travel given the uptake of remote video meetings and working-from-home. Notably, international air travel contributed no emissions over the reporting period, compared with 97.6 tCO_2e during FY2019. The longer-term impact of these changes remains to be seen.

2. BACKGROUND

The PNCC Organisational Emissions Inventory Report is compiled from usage and emissions data from the following emissions sources:

- Council stationary energy (electricity, natural gas, diesel generators) across all sites
- Wastewater processing emissions
- Vehicular fuel usage
- 'Small Plant Item' (e.g. chainsaws, leaf blowers, etc.) fuel usage
- Diesel use by Council generators
- Methane release from Awapuni and Ashhurst Landfills
- Gross waste tonnages collected from all council operated sites
- Staff air travel
- Staff commuting and taxi travel
- Air-conditioning unit gas refills
- Fertilizer use

A summary of the changes in the organisational emissions profile over time is provided below in figures 1 & 2:

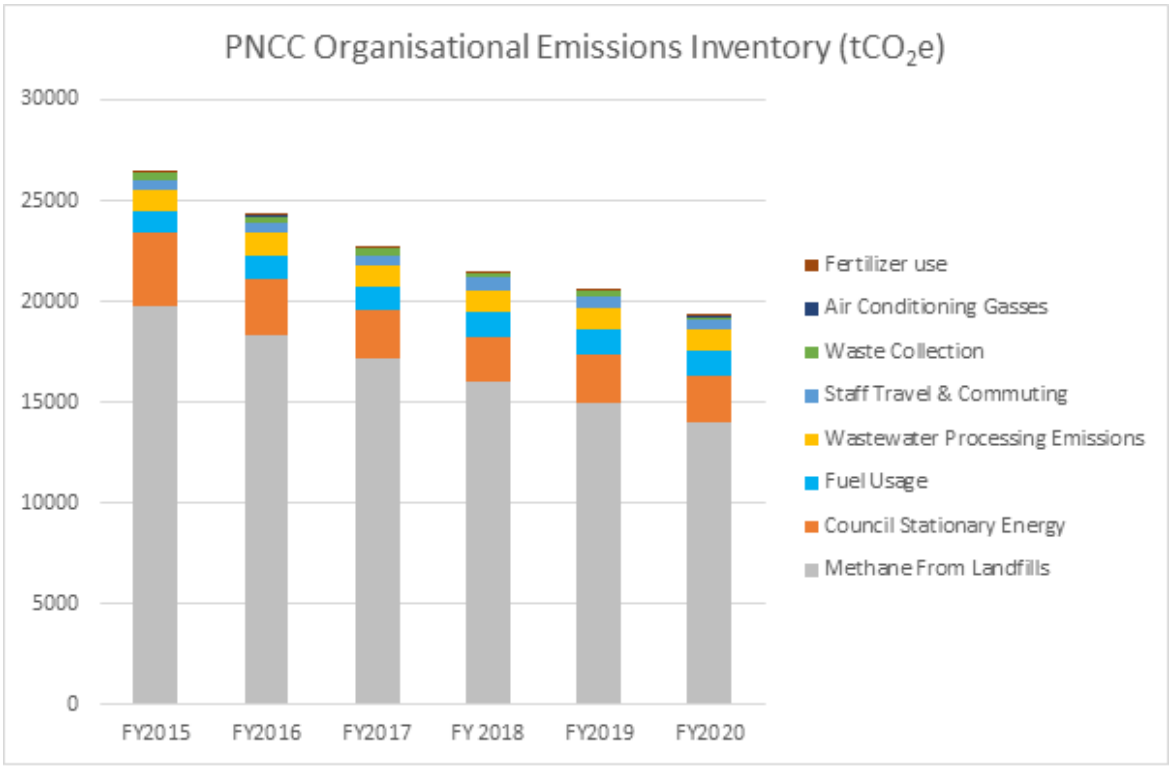


Figure 1 - Organisational Emissions Inventories FY2015 - FY2020

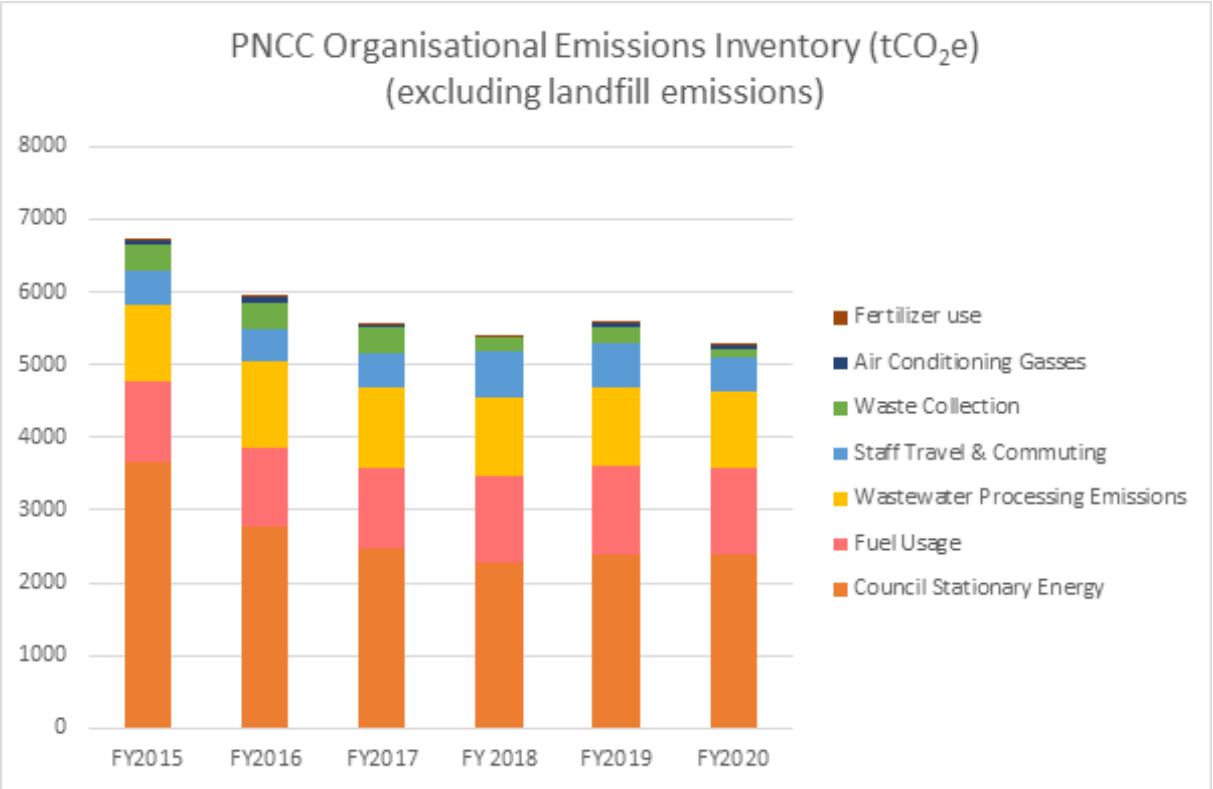


Figure 2 - Organisational Emissions Inventories (excluding landfill emissions) FY2015 - FY2020

Per officer guidance to the 9 September 2020 Environmental Sustainability Committee, once the impacts of Covid-19 lockdowns are accounted for, the non-landfill component of Council's inventory otherwise presents a stalling of the previous downward trend. This was to be expected, given that most of the low/zero cost opportunities to reduce emissions have now been exhausted, and although many significant opportunities remain, these typically require greater investment (e.g. through the Low Carbon Fund – the impact of which will only begin to appear in the inventory of the current 2022FY).

Note:

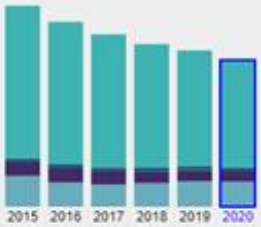
1. The inventory is presented in terms of 'carbon dioxide equivalent' or 'CO2e'. This is because other gases such as methane and nitrous oxide have different relative impacts per unit weight. For example, the refrigerant R-22, typically only released in very small volumes, has a global warming potential 12,000 greater than carbon dioxide. CO2e accounting allows for the global warming potential of different greenhouse gases to be compared with one another.

2. The emissions inventory uses the Ministry for the Environment's standard emissions factors and guidelines. This inventory has been externally audited by Toitū Envirocare to provide confidence to Council and other interested parties that our emissions inventory is a true reflection of Council's emissions profile.

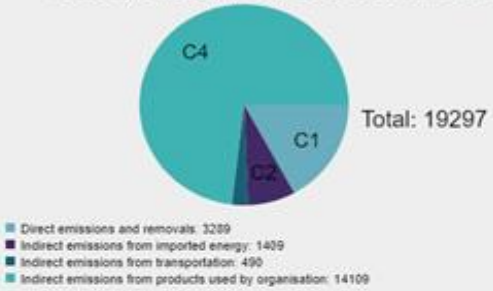
The following page presents the inventory by emission source type, and by site/activity.

Summary (Start Year)

(Click year bar for details)



tCO₂e by Category (1 July 2020 to 30 June 2021)



tCO₂e by Sources (1 July 2020 to 30 June 2021)

Waste to Landfill Municipal solid waste (CO2e)	14010
Electricity	1409
Wastewater precalculated (tCO2e)	1051
Diesel	1021
Natural Gas distributed commercial	972
Private Car default (petrol)	389
Petrol regular	168
Waste landfilled LFGR Mixed waste	99
HCFC-22 (R-22, Genetron 22 or Freon 22)	65
Air travel domestic (average)	55
Private Car average (diesel)	41
Fertiliser use Nitrogen	8
Petrol premium	3
Motorcycle	2
Bus travel (city)	2
Car Medium hybrid	2
CH4	2
Company Car average (petrol)	> 0
N2O	> 0
Taxi (regular)	> 0

tCO₂e by Sites (1 July 2020 to 30 June 2021)

/Infrastructure/Waste Management/Awapuni Landfill	13925
/Infrastructure/Three Waters/Wastewater Treatment	1322
/Parks & Reserves/Aquatic Centres/Lido Aquatic Centre	653
/Workplace Travel/Staff Commuting	457
/Infrastructure/Logistics & Support/Vehicles/Heavy Trucks	368
/Infrastructure/Property/Civic Administration Building	277
/Infrastructure/Transport/Street Lighting	276
/Infrastructure/Logistics & Support/Tankers	215
/Customer/Libraries/City Library	173
/Marketing & Communications/Arena Operations	162
/Infrastructure/Logistics & Support/Vehicles/Light Trucks	145
/Infrastructure/Three Waters/Water Treatment & Pumps	134
/Infrastructure/Logistics & Support/Vehicles/Pool Vehicles	123
/Infrastructure/Logistics & Support/Vehicles/Utility Vehicles	115
/Infrastructure/Waste Management	99
/Infrastructure/Waste Management/Ashhurst Landfill	87
/Infrastructure/Parks & Reserves/Aquatic Centres/Ashhurst	78
/Infrastructure/Parks & Reserves/Cemeteries	75
/Infrastructure/Parks & Reserves/Citywide Reserves	69
/Infrastructure/Logistics & Support/Vehicles/Medium Trucks	65
/Infrastructure/Property	65
/Infrastructure/Logistics & Support/Vehicles/Tractors	55
/Infrastructure/Logistics & Support/Vehicles/Mowers	53
/Infrastructure/Logistics & Support/Vehicles/Heavy Plant	42
/Workplace Travel/Air Travel	33
/Infrastructure/Logistics & Support/Nursery	32
../Parks & Reserves/Aquatic Centres/Freyberg Aquatic Centre	30
/Infrastructure/Parks & Reserves/Local Reserves & Sportsfields	29
/Infrastructure/Three Waters/Wastewater Pump Stations	29
/Infrastructure/Logistics & Support/Depots	21
/Infrastructure/Property/Community Centres	21
/Customer/Libraries/Youth Space	9
/Infrastructure/Three Waters/Stormwater Pump Stations	9
/Infrastructure/Property/Public Toilets	9
/Infrastructure/Transport/Traffic Signals	9
/Customer/Wildbase Recovery Centre	7
/Customer/Libraries/Mobile Library	6
/Infrastructure/Property/Social Housing Buildings	4
/Infrastructure/Logistics & Support/Vehicles/Quad Bikes	4
/Customer/Libraries/Awapuni Library	2
/Customer/City Pound	2
/Infrastructure/Transport/City Bus Terminal	2
/Customer/Libraries/Highbury Library	1
/Customer/Libraries/Roslyn Library	1
/Customer/Libraries/Ashhurst Library	1
/Workplace Travel/Hire Cars and Taxis	> 0
../Waste Management/Waste Management Operations	> 0

Table 1 - FY2020 Organisational Inventory by Emission Source and Site

3. NEXT STEPS

As noted above, putting aside the ongoing impacts of Council's response to Covid-19, most of the low/zero cost opportunities for emission reductions have already been actioned. This is not to say that there are not still significant opportunities for further reductions, many of which (as covered in the Low Carbon Fund Update to this September 2022 Committee) also carry considerable cost savings – only that these will typically require substantial investment in order to realise. Thus, between now and the 2024-2034 Long Term Plan, it is expected that the primary vehicle for the delivery of PNCC emission reductions over the next two years will be the $1,000,000pa 'Low Carbon Fund'.

The Low Carbon Fund will facilitate a more structured approach to future emissions reduction decision making, allowing for the more effective allocation of resources, and hence enabling more effective emission reduction projects overall. Officers expect to apply the same methodology to a broader range of potential projects for Council's consideration through the next LTP process.

Finally, given the reporting changes required by Toitū continue to add greater compliance costs, as well as inconsistencies with Council's baseline reporting, officers consider that future participation in the 'Carbonreduce' programme is no longer providing value for money. Now that the process is well established, organisational emissions inventories could be completed internally, while continuing the practice of external audit. Such a change would allow presentation of future inventories to committee in a much-reduced timeframe, cutting the lag time from the current ~15 months, to an estimated 3-6 months instead – allowing much more rapid feedback on Council's progress towards its reduction goals.

4. COMPLIANCE AND ADMINISTRATION

Does the Committee have delegated authority to decide?	**Yes**
Are the decisions significant?	**No**
If they are significant do they affect land or a body of water?	**No**
Can this decision only be made through a 10 Year Plan?	**No**
Does this decision require consultation through the Special Consultative procedure?	**No**
Is there funding in the current Annual Plan for these actions?	**Yes**
Are the recommendations inconsistent with any of Council's policies or plans?	**No**
The recommendations contribute to Goal 4: An Eco City	
The recommendations contribute to the achievement of action/actions in the Climate Change Plan	

The action is: Monitor, and have externally audited, PNCC greenhouse gas emissions.	
Contribution to strategic direction and to social, economic, environmental and cultural well-being	This memorandum fulfils the above action for the FY2020/21 reporting period.

ATTACHMENTS

1. PNCC Emissions Inventory and Management Report 2020-2021 ⇩

GREENHOUSE GAS EMISSIONS INVENTORY AND MANAGEMENT REPORT

Toitū carbonreduce programme

Prepared in accordance with ISO 14064-1:2018 and the Technical Requirements of the Programme

Palmerston North City Council

Prepared by (lead author): David Watson, Climate Change Analyst

Dated: 24 August 2022

Verification status: Pending

Measurement period: 01 July 2020 to 30 June 2021

Base year period: 01 July 2015 to 30 June 2016

Approved for release by:

David Watson, Climate Change Analyst

DISCLAIMER

The template has been provided by Enviro-Mark Solutions Limited (trading as Toitū Envirocare). While every effort has been made to ensure the template is consistent with the requirements of ISO 14064-1:2018, Toitū Envirocare does not accept any responsibility whether in contract, tort, equity or otherwise for any action taken, or reliance placed on it, or for any error or omission from this report. The template should not be altered (i.e. the black text); doing so may invalidate the organisation's claim that its inventory is compliant with the ISO 14064-1:2018 standard.

This work shall not be used for the purpose of obtaining emissions units, allowances, or carbon credits from two or more different sources in relation to the same emissions reductions, or for the purpose of offering for sale carbon credits which have been previously sold.

The consolidation approach chosen for the greenhouse gas inventory should not be used to make decisions related to the application of employment or taxation law.

This report shall not be used to make public greenhouse gas assertions without independent verification and issue of an assurance statement by Toitū Envirocare.

REPORT STRUCTURE

The Inventory Summary contains a high-level summary of this year's results and from year 2 onwards a brief comparison to historical inventories.

Chapter 1, the Emissions Inventory Report, includes the inventory details and forms the measure step of the organisation's application for Programme certification. The inventory is a complete and accurate quantification of the amount of GHG emissions 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 the Programme[1], which is based on the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) and ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals[2]. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

Chapter 2, the reduction plan and progress report, forms the manage step part of the organisation's application for Programme certification.

See Appendix 1 and the related Spreadsheet for detailed emissions inventory results, including a breakdown of emissions by source and sink, emissions by greenhouse gas type, and non-biogenic and bio-genic emissions. Appendix 1 also contains detailed context on the inventory boundaries, inclusions and exclusions, calculation methodology, liabilities, and supplementary results.

This overall report provides emissions information that is of interest to most users but must be read in conjunction with the inventory workbook for covering all of the requirements of ISO 14064-1:2018.

[1] Programme refers to the Toitū carbonreduce and the Toitū carbonzero programmes.
[2] 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

TABLES

FIGURES

EXECUTIVE SUMMARY

This is the annual greenhouse gas (GHG) emissions inventory and management report for Palmerston North City Council covering the measurement period 01 July 2020 to 30 June 2021.[3]

Total emissions from all of PNCCs operations in the 2020/2021 reporting period were 19,261 tCO_2e. This is a -7,183 tCO_2e (-27.2%) reduction since the 2015/2016 baseline year and a -1,317 tCO_2e (-6.4%) reduction since the last reporting period in 2019/2020. The closed landfill at Awapuni continues to be PNCCs largest single emissions source, accounting for 72% of total emissions. Emissions from the landfill continue to degrade but are not readily amenable to further mitigation. Excluding landfill, emissions from all of PNCCs operations in the 2020/2021 reporting period were 5,338 tCO_2e. This is a -1,496 tCO_2e (-21.9%) reduction since the 2015/2016 baseline year and a -374 tCO_2e (-6.6%) reduction since the last reporting period in 2019/2020. These non-landfill related emissions reductions are due to combination of factors relating to the COVID-19 lockdowns and subsequent restrictions. Of particular note is the +48 tCO_2e increase in emissions from natural gas use at the Ashhurst Aquatic Centre with equivalent increases at the Lido due to a return to normal operational hours post-COVID. These emissions have been largely offset by reductions in other areas, such as from transport and air travel, which have predictably declined due to border closures and other restrictions related to the pandemic. The largest reductions came from lower electricity use in wastewater treatment, a -140 tCO_2e reduction since last reporting year . Work on identifying cost efficient methods of further reducing PNCCs emissions and related operational expenditure continues through the Low Carbon Fund and the work of the Climate Change team.

Table 1: Inventory summary

Category (ISO 14064-1:2018)	**Scopes** (ISO 14064-1:2006)	**2016**	**2020**	**2021**
Category 1: Direct emissions	Scope 1	4,057.79	3,360.06	3,289.12
Category 2: Indirect emissions from imported energy	Scope 2	1,811.31	1,421.35	1,408.50
Category 3: Indirect emissions from transportation	Scope 3	479.33	596.87	490.22
Category 4: Indirect emissions from products used by organisation		20,095.58	15,190.23	14,294.56
Category 5: Indirect emissions associated with the use of products from the organisation		0.00	0.00	0.00
Category 6: Indirect emissions from other sources		0.00	0.00	0.00
Total direct emissions		**4,057.79**	**3,360.06**	**3,289.12**
Total indirect emissions		**22,386.23**	**17,208.45**	**16,193.28**
Total gross emissions		**26,444.02**	**20,568.51**	**19,482.40**
Category 1 direct removals		0.00	0.00	0.00
Certified renewable electricity certificates		0.00	0.00	0.00
Purchased emission reductions		0.00	0.00	0.00
Total net emissions		**26,444.02**	**20,568.51**	**19,482.40**

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

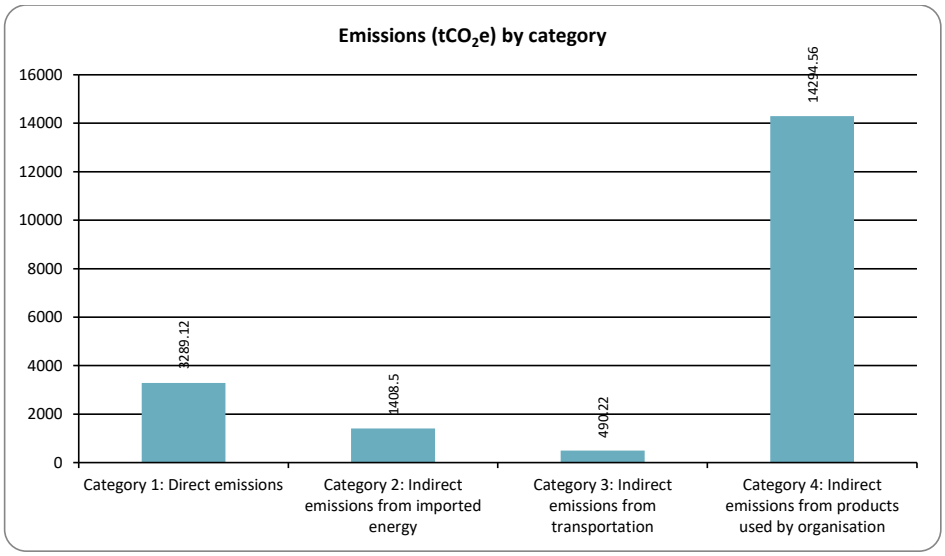


Figure 1: Emissions (tCO_2e) by Category for this measurement period

CHAPTER 1: EMISSIONS INVENTORY REPORT

1.1. INTRODUCTION

This report is the annual greenhouse gas (GHG) emissions inventory and management report for Palmerston North City Council.

This report is the annual greenhouse gas (GHG) Emissions Management and Reduction Plan prepared for Palmerston North City Council and forms the Manage step part of the organisation's application for programme certification.

Climate change will have significant impact on the city of Palmerston North, and consequently Palmerston North City Council. Impacts will include; more frequent flood events of greater severity, drier summer periods (with implications for the rural sector, and municipal water supply) and potential heat wave events exacerbated by the urban heat island effect (with implications for public health). Mitigating these impacts will be key for the long-term well-being of the City.

In its 'Eco City Strategy', council outlines the aspiration:

"We want a future-focused city that plans for and cares about the future, enhancing its natural and built environment. Our city will realise the benefits to society from creating clean energy, lowering carbon emissions and reducing our ecological footprint."

"... Palmerston North has a moral duty to reduce its emissions. A lack of action will not only contribute to further climate change, but risk the city missing out on the current wave of progress, and be forced to play catch up as international agreements strengthen. Alternatively, Palmerston North has an opportunity to be a leader, and reap the benefits of being a global leader exporting knowledge around the world."

To this end, Council has set an ambitious target for the city: A 30% reduction in citywide CO_2 emissions over the next decade. Clearly if such a target is to be achieved, Council needs to lead the way. Thus far, it has done so, having reduced its emissions by 27.2% since 2015/16. This plan outlines Council's actions over the next three years of this Long Term Plan cycle, as it makes use of its low carbon fund while building towards a more comprehensive approach to emissions reductions and management.

The inventory report and any GHG assertions are expected to be verified by a Programme-approved, third-party verifier. The level of assurance is reported in a separate Assurance Statement provided to the directors of the certification entity.

1.2. EMISSIONS INVENTORY RESULTS

Table 2: GHG emissions inventory summary for this measurement period

Measurement period: 01 July 2020 to 30 June 2021.

Category	Toitū carbon mandatory boundary (tCO_2e)	Additional emissions (tCO_2e)	Total emissions (tCO_2e)
Category 1: Direct emissions	3,289.12 Natural Gas distributed commercial, Diesel, Petrol regular, Petrol premium, Fertiliser use Nitrogen, HCFC-22 (R-22, Genetron 22 or Freon 22), Wastewater precalculated (tCO_2e), CH_4, N_2O, Company Car average (petrol)	0.00	3,289.12

Category	Toitū carbon mandatory boundary (tCO_2e)	Additional emissions (tCO_2e)	Total emissions (tCO_2e)
Category 2: Indirect emissions from imported energy	1,408.50 Electricity	0.00	1,408.50
Category 3: Indirect emissions from transportation	486.86 Air travel domestic (average), Taxi (regular), Motorcycle, Private Car average (diesel), Private Car default (petrol)	3.36 Bus travel (city), Car Medium hybrid	490.22
Category 4: Indirect emissions from products used by organisation	14,294.56 Electricity distributed T&D losses, Natural Gas distributed T&D losses, Waste landfilled LFGR Mixed waste, Waste to Landfill Municipal solid waste (CO_2e)	0.00	14,294.56
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00	0.00
Total direct emissions	**3,289.12**	**0.00**	**3,289.12**
Total indirect emissions	**16,189.92**	**3.36**	**16,193.28**
Total gross emissions	**19,479.04**	**3.36**	**19,482.40**
Category 1 direct removals	0.00	0.00	0.00
Certified renewable electricity certificates	0.00	0.00	0.00
Purchased emission reductions	0.00	0.00	0.00
Total net emissions	**19,479.04**	**3.36**	**19,482.40**

Emissions intensity	Mandatory emissions	Total emissions
Operating revenue (gross tCO_2e / $Millions)	142.18	142.21

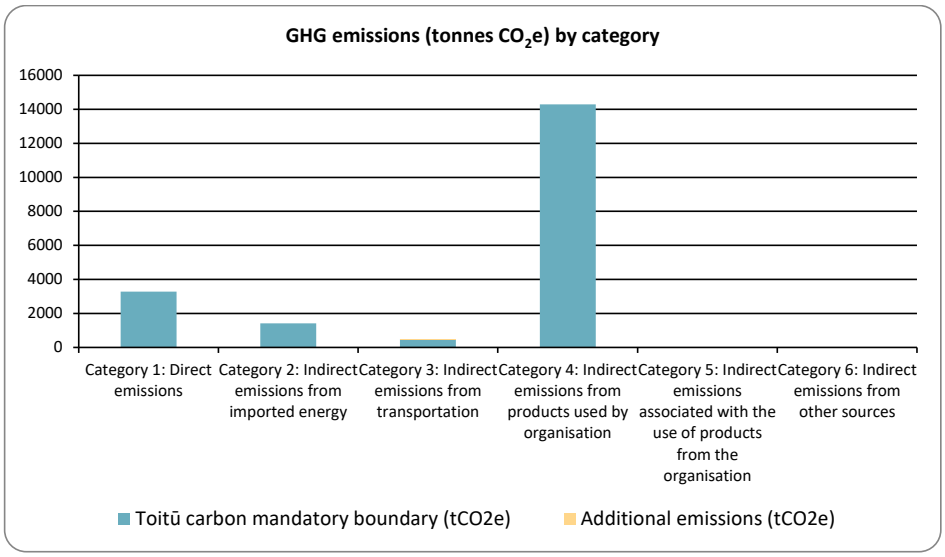


Figure 2: GHG emissions (tonnes CO_2e) by category

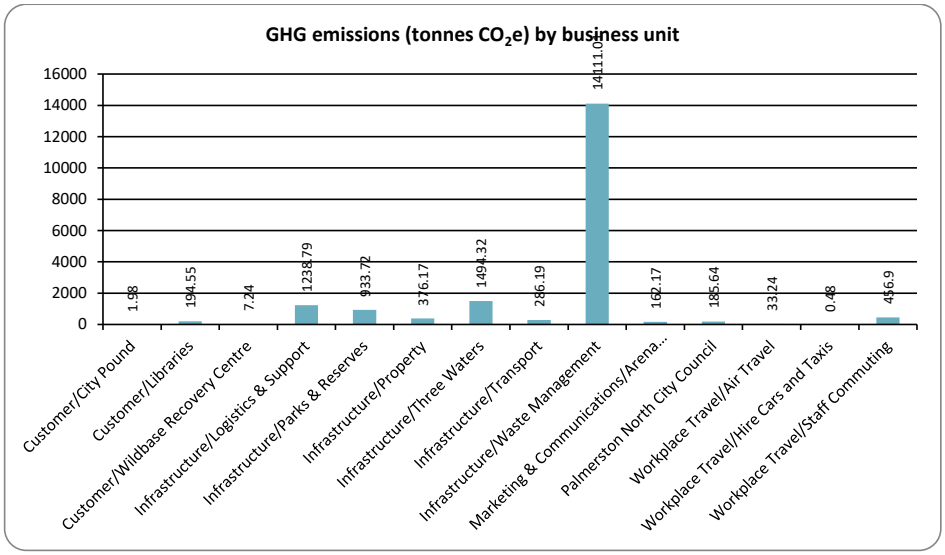


Figure 3: GHG emissions (tonnes CO_2e) by business unit

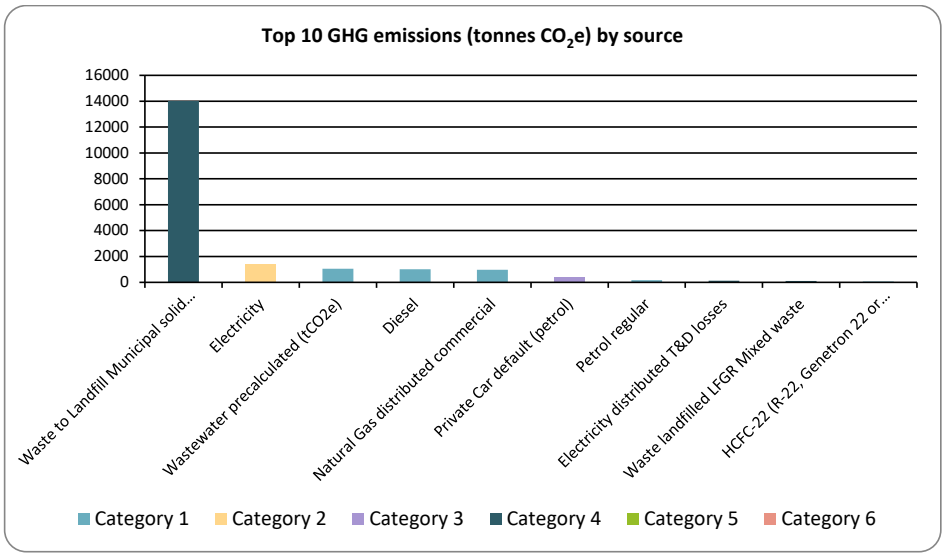


Figure 4: Top 10 GHG emissions (tonnes CO_2e) by source

1.3. ORGANISATIONAL CONTEXT

1.3.1. Organisation description

Te Kaunihera ō Papaioea, Palmerston North City Council (PNCC), is the territorial authority of Palmerston North, the lower North Island city of approximately 90,000 residents. With 545 full time equivalent staff, PNCC has responsibilities across: water supply, wastewater, stormwater, waste management, local roads, libraries, parks, community centres, animal control and regulatory services, while also providing a range of other services to the community including subsidised housing. Unlike many other councils in Aotearoa PNCC retains a substantial works department, and much of the city's maintenance work is done in-house rather than being contracted out.

PNCC through its 2021-2031 Long Term Plan (LTP) set a target of 30% reduction in citywide carbon emissions, compared to the 2016/17 baseline, by 2031. This target is the keystone of a wider series of sustainability plans that come under the 'Eco City Strategy'. This strategy includes measures around enhancing biodiversity, reducing waste, building infrastructure resilience to climate change, improving energy efficiency and encouraging active transport.

PNCC wholly owns four Council Controlled Organisations (CCOs). These are Te Manawa Museums Trust, Palmerston North Airport Limited, Globe Theatre Trust, and Regent Theatre Trust. Council is a 50% shareholder (along with Manawatū District Council) in the Central Economic Development Agency (CEDA). Council also owns three other small organisations which are exempted from CCO status. These are: Caccia Birch Trust, Palmerston North Performing Arts Trust, and the Manawatū-Whanganui Regional Disaster Relief Fund Trust.

PNCC owns a large number of properties within the city, many of which are leased out to businesses at market rates. Other properties are leased at a subsidised rate to community organisations. This includes bowls and other sports clubs, the Palmerston North Golf Course, and the lease of Hancock Community House to the Community Services Council who sublease parts of the building to other community organisations. Council also leases several of its facilities, notably its community libraries, from the private sector. Finally, while retaining ownership of the properties themselves, the operation of its community swimming pools (the Lido and Freyberg) is contracted to Community Leisure Management Limited.

Commitment to certification

Climate change will have significant impact on the city of Palmerston North, and consequently PNCC. Impacts will include; more frequent flood events of greater severity, drier summer periods (with implications for the rural sector, and municipal water supply) and potential heat wave events exacerbated by the urban heat island effect (with implications for public health). Mitigating these impacts will be key for the long-term well-being of the City.

To this end, Council has set an ambitious target for the city: A 30% reduction in citywide CO_2 emissions by 2031 as part of its Long Term Plan.

GHG Reporting

In its 'Eco City Strategy', council outlines the aspiration:

"We want a future-focused city that plans for and cares about the future, enhancing its natural and built environment. Our city will realise the benefits to society from creating clean energy, lowering carbon emissions and reducing our ecological footprint."

"... Palmerston North has a moral duty to reduce its emissions. A lack of action will not only contribute to further climate change, but risk the city missing out on the current wave of progress, and be forced to play catch up as international agreements strengthen. Alternatively, Palmerston North has an opportunity to be a leader, and reap the benefits of being a global leader exporting knowledge around the world."

To this end, Council has set an ambitious target for the city: A 30% reduction in citywide CO_2 emissions by 2031. Clearly if such a target is to be achieved, Council needs to lead the way. Thus far, it has done so, having reduced its emissions by 27.2% since 2015/16. This plan outlines Council's actions over the next three years of this Long Term Plan cycle, as it makes use of its low carbon fund while building towards a more comprehensive approach to emissions reductions and management.

Climate Change Impacts

Climate change will have significant impact on the city of Palmerston North, and consequently Palmerston North City Council. Impacts will include; more frequent flood events of greater severity, drier summer periods (with implications for the rural sector, and municipal water supply) and potential heat wave events exacerbated by the urban heat island effect (with implications for public health). Mitigating these impacts will be key for the long-term well-being of the City.

1.3.2. Statement of intent

This inventory forms part of the organisation's commitment to gain Toitū carbonreduce certification. The intended uses of this inventory are:

Intended use and users

Data management and reporting are aligned to the Toitū net Carbonzero programme requirements. The report will be applied to the Carbonreduce programme and will help to target decision making and project development across council.

1.3.3. Person responsible

David Murphy, Chief Planning Officer is responsible for overall emission inventory measurement and reduction performance, as well as reporting results to top management. David Murphy, Chief Planning Officer has the authority to represent top management and has financial authority to authorise budget for the Programme, including Management projects and any Mitigation objectives.

State any other people/entities involved

This report was prepared with the assistance of Adam Jarvis, Senior Climate Change Advisor, who was responsible for previous annual inventory reports since inception.

The officers involved in the compilation of this report have over a decade of combined experience in data engineering and management, including significant experience in carbon modelling, and data-driven scientific research.

Top management commitment

PNCC Councillors will receive and approve this report following auditing and verification.

Management involvement

Management provided support to officers as and when required.

1.3.4. Reporting period

Base year measurement period: 01 July 2015 to 30 June 2016

The base year was selected based on the availability of data.

Measurement period of this report: 01 July 2020 to 30 June 2021

Reports are completed annually.

The first PNCC carbon inventory was competed in 2019 and considered the 2015/2016 financial year July to June.

1.3.5. Organisational boundary and consolidation approach

An operational control consolidation approach was used to account for emissions.[4]

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

Justification of consolidation approach

As the purpose of the inventory is to develop programmes to reduce emissions only those assets and processes that PNCC have operational control over are included in the inventory.

Organisational structure

Figure 5 shows what has been included in the context of the overall structure.

The organisational chart provides a summary overview of the primary PNCC structures and business units, outlining which units are included within the scope of this report.

[4]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.

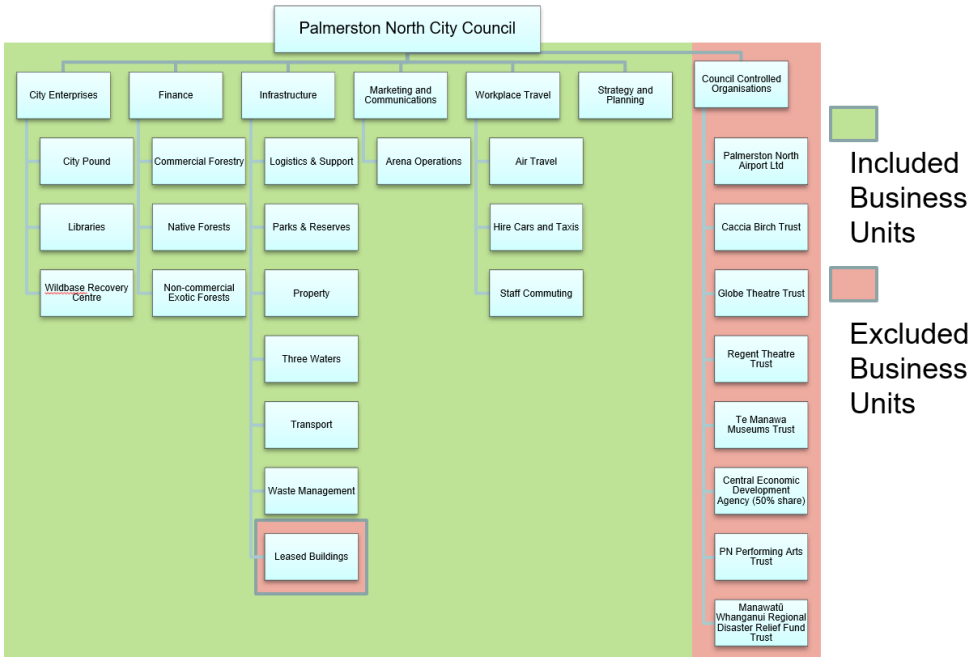


Figure 5: Organisational structure

Table 3. Brief description of business units, sites and locations included in this emissions inventory

Portfolio Categories	Property/Facility Name	No. of Buildings	Sub-Building Name
Operational Facilities (105 Buildings)	Civic Administration Building (Although structurally 5 building but treated as one building)	1	Council Chambers and shops
			East and West Wing Building and Central Core
			Ground Floor and Shops Building Regulations area)
	CET Arena	14	Arena 5, Barber Hall
			Arena 1 (Grandstand Building)
			Arena 2
			Arena 3
			Arena 4 (B&M Centre)
			Horse Pavilion (Arena 6)

Portfolio Categories	Property/Facility Name	No. of Buildings	Sub-Building Name
			Sand storage shade
			Speedway Workshop Building
			Toilet block (Southern Side)
			Toilet Block (Western side)
			Sports fields changing room
			Sports fields storage building
			Sports fields garage store shed
			Sports fields workshop/storage building
	Libraries and Branches	3	Central Library
			Ashhurst Library and garage (also known as old post office)
			Highbury Library
	Water Treatment Plant	4	Clarifier and Flocculation Tank
			Sludge Tank
			Clear Water Tank
			Admin/Control Building
	Wastewater Treatment Plant	7	Main Admin Block
			Anaerobic Digesters
			Pre-aeration Tank and Sedimentation Tanks
			Secondary Clarifier
			UV Building and associate channels
			Sludge Drying Building and Chemical Tanks
			Liquid Waste Facility
	Awapuni Recycling Centre, Ashurst and Bunnythorpe Transfer Stations	8	Main Recycling Building
			Admin Block
			Waste Management Portacom
			Waste Management Building

Portfolio Categories	Property/Facility Name	No. of Buildings	Sub-Building Name
			Timber Recycling Building
			Weigh station Portacom
			Gas Flare Shed
			Ashhurst Transfer Station (Portacom)
	Kelvin Grove Cemetery	7	Crematorium
			Staff Amenities/Toilets
			Storage Shed
			Old Workshop
			New Workshop
			New Garage (By Pat's house)
			Pat's House
	Conference and Function Centre	1	Conference and Function Centre
	Globe Theatre	1	Globe Theatre
	Dog Pound	1	Dog Pound/ City pound
	The Depot	12	Amenities Block
			Recycling Centre
			Store Room (Below Leisure Community Centre)
			Workshops/Garage (including office space
			Nursery Workshop/ Carpenters Workshop
			Vehicle Shelters
			Covered Shed 3 (back left corner)
			Covered Shed 4 (behind Community Centre) - Pipe Storage Shed
			Covered Shed 5 (by carpark)
			Covered Shed 6 (rear of site/plywood walls)
			Garage 3 (Civil Defence)
			Toilet Block

Portfolio Categories	Property/Facility Name	No. of Buildings	Sub-Building Name
	I-site and public Toilet	2	i-Site
			Public toilet
	3 water facilities (Pump Stations, chlorine building, bores etc)	18	Aokautere Sewer Pump Station
			Aokautere booster pump station building
			Ashhurst Bore Station Building
			Ashhurst water polishing building
			Bunnythorpe Water Treatment Plant Building
			Keith Street Bore Pump House
			Papaioea Park Bore Pump Station
			Papaioea Chlorine storage building water bores and pump station
			Railway Road Boar and Pump Station and Chemical storage building
			Roberts Line Pump House
			Roberts line new bore building
			Takaro Bore Pump House
			Upper Dam hydro building
			WWPS Maxwell's Line
			WWPS Jickell
			WWPS Massey
			WW Pumpstation Tremaine Avenue
			WW Pumpstation- Reserve Road
	Fitzherbert Depot Facilities	7	PNCC Fitzherbert Depot -Workshop, Office & Stores Building
			Staff Amenity Room
			Shed 1 - by Staff Amenity
			Shed 2 - Mower's shade
			Shed 3- (between staff amenity and ground staff shed)

Portfolio Categories	Property/Facility Name	No. of Buildings	Sub-Building Name
			Shed 4- Adjacent to Mower Shed
			Shed 5- Ground staff shed
	Public Toilet (Stand alone public toilet - not located in the premises of other facilities)	20	Moturimu Whare (Gordon Kear Forest) Public Toilet
			Arapuke Forest Park Public Toilet – Scotts Rd
			Bunnythorpe Public Toilets Campbell St
			Dittmer bridge toilets - He Ara Kotahi
			Guilford Street Public Toilets
			Hokowhitu Shops Public Toilets
			Kahuterawa Reserve Toilet Block
			Kahuterawa Road End Car Park Toilet
			Linklater Reserve Public Toilet
			Longburn Public Toilet
			Mahanga Kakariki Reserve
			Manawatu Gorge Carpark Toilets
			Milverton Park Public Toilets
			Papaioea Park Public Toilets
			Paneiri Park changing room
			Railway Land Public Toilets (skate park)
			Ruamahanga Wilderness Reserve
			Takaro Park Toilets
			Terrace End Public Toilets
			Waterloo Park Public Toilet

1.3.6. Excluded business units

Excluded from this inventory are:

1) Council Controlled Organisations. These organisations, while associated with PNCC, are separately managed and use different data management systems. Consequently, they have been excluded from this inventory.

2) Emissions from Council owned leased buildings. These emissions (e.g. from tenants energy use) are largely outside of the control of Council, and are thus not included in this inventory.

3) Embodied emissions of purchased Council products. Council procurement policy encourages officers to make sustainable purchasing decisions, but Council purchases an extremely wide range of products from a similarly wide range of suppliers, with highly variable carbon accounting practices and methodologies. Consequently, these emissions have been excluded at this stage.

4) Emissions resulting from externally contracted civil works and services. As above, Council procurement policy encourages the use of contractors that demonstrate sustainable practices, but for the same reasons these emissions are not currently within the scope of this inventory.

CHAPTER 2: EMISSIONS MANAGEMENT AND REDUCTION REPORT

2.1. EMISSIONS REDUCTION RESULTS

Council is currently on track to achieve its GHG reduction targets, having reduced its emissions by 27.2% since the 2015/16 baseline year. If this trajectory can be maintained a 30% reduction should be achieved by the 2022/23 reporting year, seven years ahead of schedule.

Council's emissions remain dominated by gas from Awapuni Landfill, which accounts for the entire city's waste over a period of many decades. A modern landfill gas capture system has been installed at the site, and there seems to be little avenue to substantially further reduce these emissions. However, gas production at the site is declining over time as the landfill waste matures.

Table 4: Comparison of historical GHG inventories

Category	2016	2017	2018	2019	2020	2021
Category 1: Direct emissions	4,057.79	3,190.78	2,941.98	3,118.95	3,360.06	3,289.12
Category 2: Indirect emissions from imported energy	1,811.31	1,945.25	1,795.03	1,454.97	1,421.35	1,408.50
Category 3: Indirect emissions from transportation	479.33	453.62	459.18	631.02	596.87	490.22
Category 4: Indirect emissions from products used by organisation	20,095.58	18,734.58	17,495.58	16,195.48	15,190.23	14,294.56
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00	0.00	0.00	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00	0.00	0.00	0.00	0.00
Total direct emissions	**4,057.79**	**3,190.78**	**2,941.98**	**3,118.95**	**3,360.06**	**3,289.12**
Total indirect emissions	**22,386.23**	**21,133.45**	**19,749.79**	**18,281.46**	**17,208.45**	**16,193.28**
Total gross emissions	**26,444.02**	**24,324.22**	**22,691.77**	**21,400.42**	**20,568.51**	**19,482.40**
Category 1 direct removals	0.00	0.00	0.00	0.00	0.00	0.00

Category	2016	2017	2018	2019	2020	2021
Certified renewable electricity certificates	0.00	0.00	0.00	0.00	0.00	0.00
Purchased emission reductions	0.00	0.00	0.00	0.00	0.00	0.00
Total net emissions	**26,444.02**	**24,324.22**	**22,691.77**	**21,400.42**	**20,568.51**	**19,482.40**
Emissions intensity						
Operating revenue (gross tCO_2e / $Millions)	239.59	193.05	176.32	149.65	141.85	142.21
Operating revenue (gross mandatory tCO_2e / $Millions)	239.54	193.00	176.27	149.64	141.83	142.18

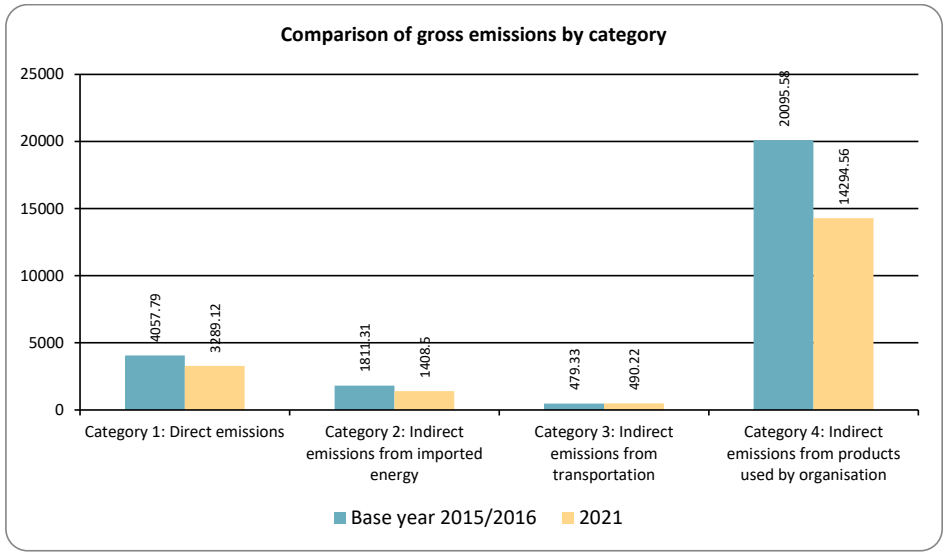


Figure 6: Comparison of gross emissions by category between the reporting periods

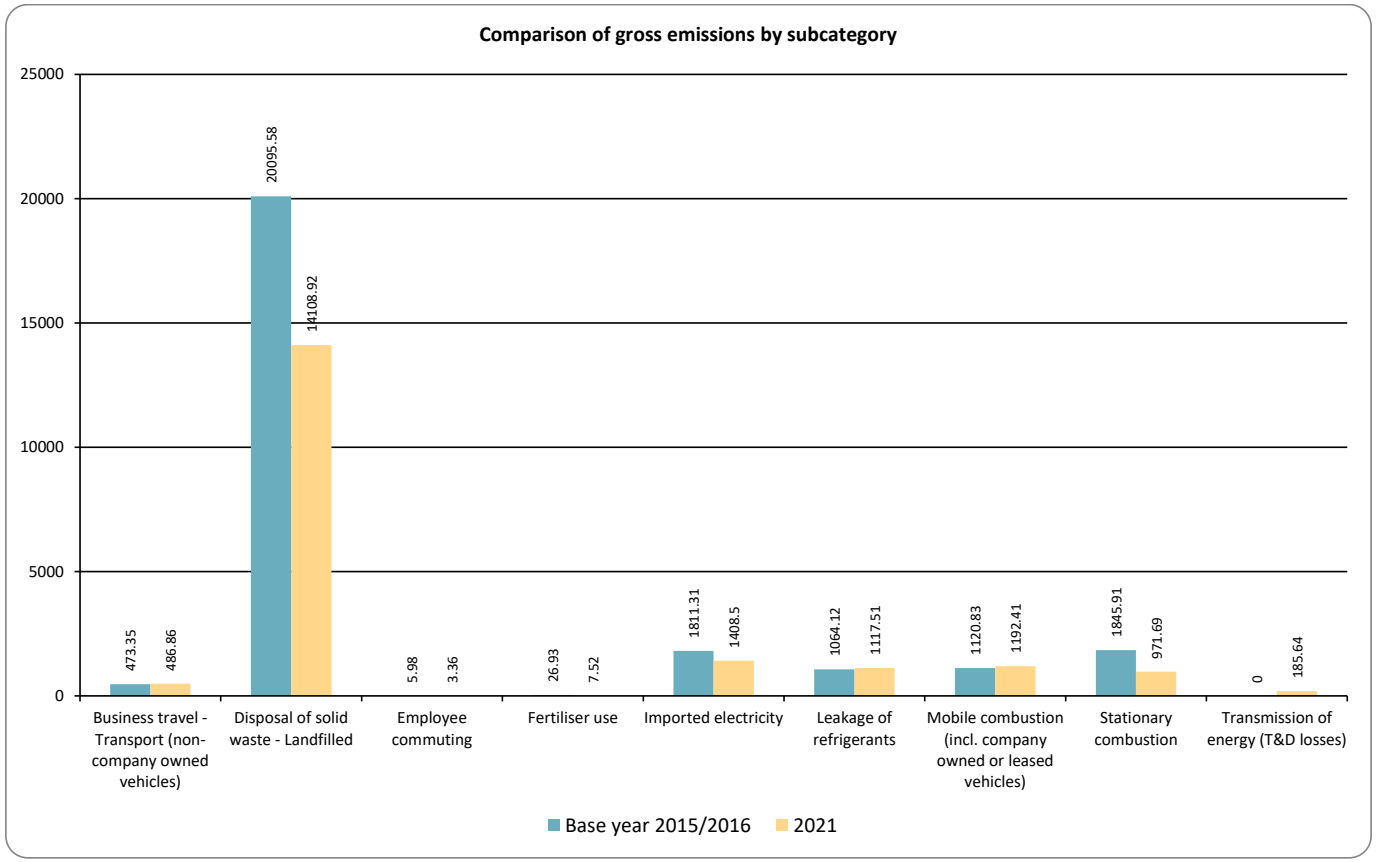


Figure 7: Comparison of gross emissions by subcategory between the reporting periods

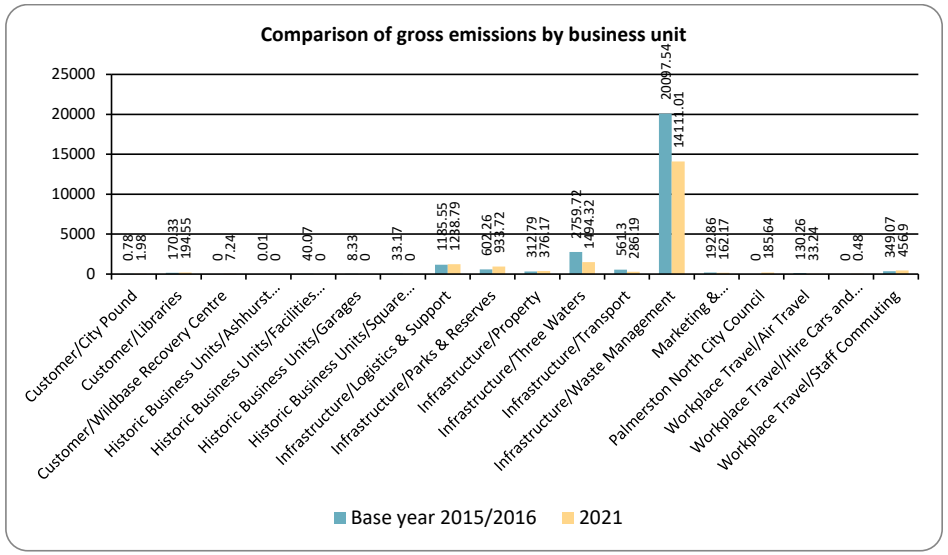


Figure 8: Comparison of gross emissions by business unit between the reporting periods

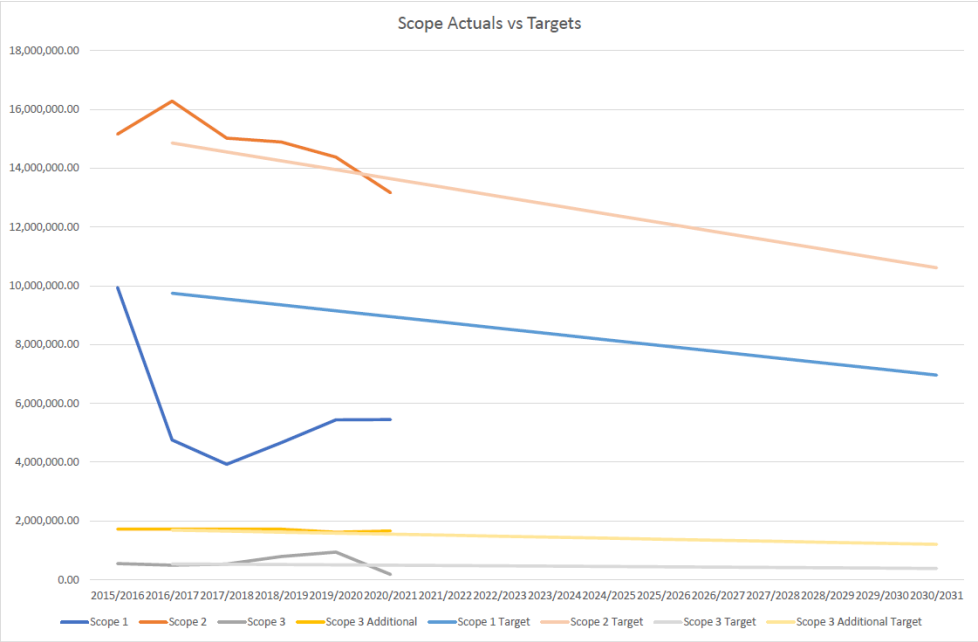


Figure 9: Performance against target since base year

Table 5. Performance against plan

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Customer/Libraries/City Library	Natural Gas distributed commercial		Scope 1	387,347.00	379600.060	371853.120	364106.180	356359.240	348612.300	340865.360	333118.420	325371.480	317624.540	309877.600	302130.660	294383.720	286636.780	278889.840	271142.900
Customer/Libraries/Mobile Library	Diesel		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Customer/Libraries/Youth Space	Natural Gas distributed commercial		Scope 1	53,486.00	52416.280	51346.560	50276.840	49207.120	48137.400	47067.680	45997.960	44928.240	43858.520	42788.800	41719.080	40649.360	39579.640	38509.920	37440.200
Historic Business Units/Facilities Management	HCFC-22 (R-22, Genetron 22 or Freon 22)		Scope 1	11.40	11.172	10.944	10.716	10.488	10.260	10.032	9.804	9.576	9.348	9.120	8.892	8.664	8.436	8.208	7.980
Historic Business Units/Facilities Management	Natural Gas distributed commercial		Scope 1	22,884.00	22426.320	21968.640	21510.960	21053.280	20595.600	20137.920	19680.240	19222.560	18764.880	18307.200	17849.520	17391.840	16934.160	16476.480	16018.800

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Historic Business Units/Facilities Management	R-410A		Scope 1	0.80	0.784	0.768	0.752	0.736	0.720	0.704	0.688	0.672	0.656	0.640	0.624	0.608	0.592	0.576	0.560
Historic Business Units/Facilities Management	R-438A		Scope 1	3.10	3.038	2.976	2.914	2.852	2.790	2.728	2.666	2.604	2.542	2.480	2.418	2.356	2.294	2.232	2.170
Historic Business Units/Garages	Natural Gas distributed commercial		Scope 1	42,910.00	42051.800	41193.600	40335.400	39477.200	38619.000	37760.800	36902.600	36044.400	35186.200	34328.000	33469.800	32611.600	31753.400	30895.200	30037.000
Infrastructure/Logistics & Support/Depots	Natural Gas distributed commercial		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Logistics & Support/Nursery	Natural Gas distributed commercial		Scope 1	228,303.00	223736.940	219170.880	214604.820	210038.760	205472.700	200906.640	196340.580	191774.520	187208.460	182642.400	178076.340	173510.280	168944.220	164378.160	159812.100
Infrastructure/Logistics & Support/Tankers	Diesel		Scope 1	73,006.00	71545.880	70085.760	68625.640	67165.520	65705.400	64245.280	62785.160	61325.040	59864.920	58404.800	56944.680	55484.560	54024.440	52564.320	51104.200

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Logistics & Support/Tankers	Petrol regular		Scope 1	6,366.00	6238.680	6111.360	5984.040	5856.720	5729.400	5602.080	5474.760	5347.440	5220.120	5092.800	4965.480	4838.160	4710.840	4583.520	4456.200
Infrastructure/Logistics & Support/Vehicles/ Heavy Plant	Diesel		Scope 1	7,817.00	7660.660	7504.320	7347.980	7191.640	7035.300	6878.960	6722.620	6566.280	6409.940	6253.600	6097.260	5940.920	5784.580	5628.240	5471.900
Infrastructure/Logistics & Support/Vehicles/ Heavy Plant	Petrol premium		Scope 1	978.00	958.440	938.880	919.320	899.760	880.200	860.640	841.080	821.520	801.960	782.400	762.840	743.280	723.720	704.160	684.600
Infrastructure/Logistics & Support/Vehicles/ Heavy Plant	Petrol regular		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Logistics & Support/Vehicles/ Heavy Trucks	Diesel		Scope 1	122,872.00	120414.560	117957.120	115499.680	113042.240	110584.800	108127.360	105669.920	103212.480	100755.040	98297.600	95840.160	93382.720	90925.280	88467.840	86010.400
Infrastructure/Logistics & Support/Vehicles/ Leased Vehicles	Diesel		Scope 1	13,632.00	13359.360	13086.720	12814.080	12541.440	12268.800	11996.160	11723.520	11450.880	11178.240	10905.600	10632.960	10360.320	10087.680	9815.040	9542.400
Infrastructure/Logistics & Support/Vehicles/ Leased Vehicles	Petrol premium		Scope 1	1,260.00	1234.800	1209.600	1184.400	1159.200	1134.000	1108.800	1083.600	1058.400	1033.200	1008.000	982.800	957.600	932.400	907.200	882.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Logistics & Support/Vehicles/ Leased Vehicles	Petrol regular		Scope 1	24,469.00	23979.620	23490.240	23000.860	22511.480	22022.100	21532.720	21043.340	20553.960	20064.580	19575.200	19085.820	18596.440	18107.060	17617.680	17128.300
Infrastructure/Logistics & Support/Vehicles/ Light Trucks	Diesel		Scope 1	33,709.00	33034.820	32360.640	31686.460	31012.280	30338.100	29663.920	28989.740	28315.560	27641.380	26967.200	26293.020	25618.840	24944.660	24270.480	23596.300
Infrastructure/Logistics & Support/Vehicles/ Light Trucks	Petrol regular		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Logistics & Support/Vehicles/ Medium Trucks	Diesel		Scope 1	30,224.00	29619.520	29015.040	28410.560	27806.080	27201.600	26597.120	25992.640	25388.160	24783.680	24179.200	23574.720	22970.240	22365.760	21761.280	21156.800
Infrastructure/Logistics & Support/Vehicles/ Mowers	Diesel		Scope 1	8,281.00	8115.380	7949.760	7784.140	7618.520	7452.900	7287.280	7121.660	6956.040	6790.420	6624.800	6459.180	6293.560	6127.940	5962.320	5796.700
Infrastructure/Logistics & Support/Vehicles/ Mowers	Petrol regular		Scope 1	215.00	210.700	206.400	202.100	197.800	193.500	189.200	184.900	180.600	176.300	172.000	167.700	163.400	159.100	154.800	150.500

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Logistics & Support/Vehicles/Pool Vehicles	Diesel		Scope 1	35,821.00	35104.580	34388.160	33671.740	32955.320	32238.900	31522.480	30806.060	30089.640	29373.220	28656.800	27940.380	27223.960	26507.540	25791.120	25074.700
Infrastructure/Logistics & Support/Vehicles/Pool Vehicles	Petrol regular		Scope 1	38,210.00	37445.800	36681.600	35917.400	35153.200	34389.000	33624.800	32860.600	32096.400	31332.200	30568.000	29803.800	29039.600	28275.400	27511.200	26747.000
Infrastructure/Logistics & Support/Vehicles/Quad Bikes	Diesel		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Logistics & Support/Vehicles/Quad Bikes	Petrol regular		Scope 1	1,635.00	1602.300	1569.600	1536.900	1504.200	1471.500	1438.800	1406.100	1373.400	1340.700	1308.000	1275.300	1242.600	1209.900	1177.200	1144.500
Infrastructure/Logistics & Support/Vehicles/Tractors	Diesel		Scope 1	21,482.00	21052.360	20622.720	20193.080	19763.440	19333.800	18904.160	18474.520	18044.880	17615.240	17185.600	16755.960	16326.320	15896.680	15467.040	15037.400
Infrastructure/Logistics & Support/Vehicles/Utility Vehicles	Diesel		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Parks & Reserves	Fertiliser use Nitrogen		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Aquatic Centres/Ashhurst	Natural Gas distributed commercial		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Aquatic Centres/Lido Aquatic Centre	Natural Gas distributed commercial		Scope 1	1,489,882.00	1460084.360	1430286.720	1400489.080	1370691.440	1340893.800	1311096.160	1281298.520	1251500.880	1221703.240	1191905.600	1162107.960	1132310.320	1102512.680	1072715.040	1042917.400
Infrastructure/Parks & Reserves/Cemeteries	Natural Gas distributed commercial		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Citywide Reserves	Natural Gas distributed commercial		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Parks & Reserves/Local Reserves & Sports fields	Fertiliser use Nitrogen		Scope 1	2,310.000	2263.800	2217.600	2171.400	2125.200	2079.000	2032.800	1986.600	1940.400	1894.200	1848.000	1801.800	1755.600	1709.400	1663.200	1617.000
Infrastructure/Parks & Reserves/Local Reserves & Sports fields	Natural Gas distributed commercial		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Property	HCFC-22 (R-22, Genetron 22 or Freon 22)		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Property	HFC-134a		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Property	R-410A		Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Property/Civic Administration Building	Natural Gas distributed commercial		Scope 1	702,492.00	688442.160	674392.320	660342.480	646292.640	632242.800	618192.960	604143.120	590093.280	576043.440	561993.600	547943.760	533893.920	519844.080	505794.240	491744.400
Infrastructure/Property/Community Centres	Natural Gas distributed commercial		Scope 1	1,024.00	1003.520	983.040	962.560	942.080	921.600	901.120	880.640	860.160	839.680	819.200	798.720	778.240	757.760	737.280	716.800
Infrastructure/Three Waters/Wastewater Treatment	Natural Gas distributed commercial		Scope 1	6,132,856.00	6010198.880	5887541.760	5764884.640	5642227.520	5519570.400	5396913.280	5274256.160	5151599.040	5028941.920	4906284.800	4783627.680	4660970.560	4538313.440	4415656.320	4292999.200

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Three Waters/Wastewater Treatment	Wastewater precalculated (tCO_2e)	Waste Emissions from Totara Rd & Ashhurst Oxidation Ponds	Scope 1	1,033.00	1012.340	991.680	971.020	950.360	929.700	909.040	888.380	867.720	847.060	826.400	805.740	785.080	764.420	743.760	723.100
Infrastructure/Waste Management/Ashhurst Landfill	Waste to Landfill Municipal solid waste (CO_2e)		Scope 1	114.00	111.720	109.440	107.160	104.880	102.600	100.320	98.040	95.760	93.480	91.200	88.920	86.640	84.360	82.080	79.800
Infrastructure/Waste Management/Awapuni Landfill	CH_4	Biogas Burning	Scope 1	0.06	0.059	0.058	0.056	0.055	0.054	0.053	0.052	0.050	0.049	0.048	0.047	0.046	0.044	0.043	0.042

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Waste Management/Awapuni Landfill	N_2O	Biogas Burning	Scope 1	0.00	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Infrastructure/Waste Management/Awapuni Landfill	Waste to Landfill Municipal solid waste (CO_2e)		Scope 1	19,609.00	19216.820	18824.640	18432.460	18040.280	17648.100	17255.920	16863.740	16471.560	16079.380	15687.200	15295.020	14902.840	14510.660	14118.480	13726.300
Marketing & Communications/ Arena Operations	Natural Gas distributed commercial		Scope 1	443,263.00	434397.740	425532.480	416667.220	407801.960	398936.700	390071.440	381206.180	372340.920	363475.660	354610.400	345745.140	336879.880	328014.620	319149.360	310284.100
Workplace Travel/Hire Cars and Taxis	Company Car average (petrol)	Hire Cars	Scope 1	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
			Scope 1 TOTAL		9748555.254	9549605.147	9350655.039	9151704.932	8952754.825	8753804.718	8554854.610	8355904.503	8156954.396	7958004.289	7759054.182	7560104.074	7361153.967	7162203.860	6963253.753
Customer/City Pound	Electricity		Scope 2	6,549.00	6418.020	6287.040	6156.060	6025.080	5894.100	5763.120	5632.140	5501.160	5370.180	5239.200	5108.220	4977.240	4846.260	4715.280	4584.300
Customer/Libraries/Ashhurst Library	Electricity		Scope 2	9,081.00	8899.380	8717.760	8536.140	8354.520	8172.900	7991.280	7809.660	7628.040	7446.420	7264.800	7083.180	6901.560	6719.940	6538.320	6356.700
Customer/Libraries/Awapuni Library	Electricity		Scope 2	21,938.00	21499.240	21060.480	20621.720	20182.960	19744.200	19305.440	18866.680	18427.920	17989.160	17550.400	17111.640	16672.880	16234.120	15795.360	15356.600
Customer/Libraries/City Library	Electricity		Scope 2	620,282.00	607876.360	595470.720	583065.080	570659.440	558253.800	545848.160	533442.520	521036.880	508631.240	496225.600	483819.960	471414.320	459008.680	446603.040	434197.400
Customer/Libraries/Highbury Library	Electricity		Scope 2	1,341.00	1314.180	1287.360	1260.540	1233.720	1206.900	1180.080	1153.260	1126.440	1099.620	1072.800	1045.980	1019.160	992.340	965.520	938.700
Customer/Libraries/Roslyn Library	Electricity		Scope 2	9,777.00	9581.460	9385.920	9190.380	8994.840	8799.300	8603.760	8408.220	8212.680	8017.140	7821.600	7626.060	7430.520	7234.980	7039.440	6843.900
Customer/Libraries/Youth Space	Electricity		Scope 2	46,733.00	45798.340	44863.680	43929.020	42994.360	42059.700	41125.040	40190.380	39255.720	38321.060	37386.400	36451.740	35517.080	34582.420	33647.760	32713.100
Customer/Wildbase Recovery Centre	Electricity		Scope 2	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Historic Business Units/Ashhurst Transfer Station	Electricity	Ashhurst Transfer Station	Scope 2	77.00	75.460	73.920	72.380	70.840	69.300	67.760	66.220	64.680	63.140	61.600	60.060	58.520	56.980	55.440	53.900
Historic Business Units/Facilities Management	Electricity		Scope 2	52,735.00	51680.300	50625.600	49570.900	48516.200	47461.500	46406.800	45352.100	44297.400	43242.700	42188.000	41133.300	40078.600	39023.900	37969.200	36914.500
Historic Business Units/Square Gardens	Electricity		Scope 2	277,647.00	272094.060	266541.120	260988.180	255435.240	249882.300	244329.360	238776.420	233223.480	227670.540	222117.600	216564.660	211011.720	205458.780	199905.840	194352.900
Infrastructure/Logistics & Support/Depots	Electricity		Scope 2	170,579.00	167167.420	163755.840	160344.260	156932.680	153521.100	150109.520	146697.940	143286.360	139874.780	136463.200	133051.620	129640.040	126228.460	122816.880	119405.300
Infrastructure/Parks & Reserves/Aquatic Centres/Ashhurst	Electricity		Scope 2	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Aquatic Centres/Freyberg Aquatic Centre	Electricity		Scope 2	278,669.00	273095.620	267522.240	261948.860	256375.480	250802.100	245228.720	239655.340	234081.960	228508.580	222935.200	217361.820	211788.440	206215.060	200641.680	195068.300

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Parks & Reserves/Aquatic Centres/Lido Aquatic Centre	Electricity		Scope 2	2,111,944.00	2069705.120	2027466.240	1985227.360	1942988.480	1900749.600	1858510.720	1816271.840	1774032.960	1731794.080	1689555.200	1647316.320	1605077.440	1562838.560	1520599.680	1478360.800
Infrastructure/Parks & Reserves/Cemeteries	Electricity		Scope 2	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Citywide Reserves	Electricity		Scope 2	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Infrastructure/Parks & Reserves/Local Reserves & Sports fields	Electricity		Scope 2	3,362.00	3294.760	3227.520	3160.280	3093.040	3025.800	2958.560	2891.320	2824.080	2756.840	2689.600	2622.360	2555.120	2487.880	2420.640	2353.400
Infrastructure/Property/Civic Administration Building	Electricity		Scope 2	1,367,567.00	1340215.660	1312864.320	1285512.980	1258161.640	1230810.300	1203458.960	1176107.620	1148756.280	1121404.940	1094053.600	1066702.260	1039350.920	1011999.580	984648.240	957296.900
Infrastructure/Property/Community Centres	Electricity		Scope 2	101,886.00	99848.280	97810.560	95772.840	93735.120	91697.400	89659.680	87621.960	85584.240	83546.520	81508.800	79471.080	77433.360	75395.640	73357.920	71320.200

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Property/Social Housing Buildings	Electricity		Scope 2	5,217.00	5112.660	5008.320	4903.980	4799.640	4695.300	4590.960	4486.620	4382.280	4277.940	4173.600	4069.260	3964.920	3860.580	3756.240	3651.900
Infrastructure/Three Waters/Stormwater Pump Stations	Electricity		Scope 2	38,099.00	37337.020	36575.040	35813.060	35051.080	34289.100	33527.120	32765.140	32003.160	31241.180	30479.200	29717.220	28955.240	28193.260	27431.280	26669.300
Infrastructure/Three Waters/Wastewater Pump Stations	Electricity		Scope 2	292,447.00	286598.060	280749.120	274900.180	269051.240	263202.300	257353.360	251504.420	245655.480	239806.540	233957.600	228108.660	222259.720	216410.780	210561.840	204712.900
Infrastructure/Three Waters/Wastewater Treatment	Electricity		Scope 2	2,912,914.00	2854655.720	2796397.440	2738139.160	2679880.880	2621622.600	2563364.320	2505106.040	2446847.760	2388589.480	2330331.200	2272072.920	2213814.640	2155556.360	2097298.080	2039039.800
Infrastructure/Three Waters/Water Treatment & Pumps	Electricity		Scope 2	1,240,555.00	1215743.900	1190932.800	1166121.700	1141310.600	1116499.500	1091688.400	1066877.300	1042066.200	1017255.100	992444.000	967632.900	942821.800	918010.700	893199.600	868388.500
Infrastructure/Transport/City Bus Terminal	Electricity		Scope 2	6,447.00	6318.060	6189.120	6060.180	5931.240	5802.300	5673.360	5544.420	5415.480	5286.540	5157.600	5028.660	4899.720	4770.780	4641.840	4512.900
Infrastructure/Transport/Street Lighting	Electricity		Scope 2	4,544,639.00	4453746.220	4362853.440	4271960.660	4181067.880	4090175.100	3999282.320	3908389.540	3817496.760	3726603.980	3635711.200	3544818.420	3453925.640	3363032.860	3272140.080	3181247.300

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Infrastructure/Transport/Traffic Signals	Electricity		Scope 2	147,816.00	144859.680	141903.360	138947.040	135990.720	133034.400	130078.080	127121.760	124165.440	121209.120	118252.800	115296.480	112340.160	109383.840	106427.520	103471.200
Infrastructure/Waste Management/Waste Management Operations	Electricity		Scope 2	1,335.00	1308.300	1281.600	1254.900	1228.200	1201.500	1174.800	1148.100	1121.400	1094.700	1068.000	1041.300	1014.600	987.900	961.200	934.500
Marketing & Communications/ Arena Operations	Electricity		Scope 2	893,824.00	875947.520	858071.040	840194.560	822318.080	804441.600	786565.120	768688.640	750812.160	732935.680	715059.200	697182.720	679306.240	661429.760	643553.280	625676.800
			Scope 2 TOTAL		148601 90.800	145569 21.600	142536 52.400	139503 83.200	136471 14.000	133438 44.800	130405 75.600	127373 06.400	124340 37.200	121307 68.000	118274 98.800	115242 29.600	112209 60.400	109176 91.200	106144 22.000
Infrastructure/Waste Management	Waste landfilled LFGR Mixed waste	Total MSW from all facilities	Scope 3	840.00	823.200	806.400	789.600	772.800	756.000	739.200	722.400	705.600	688.800	672.000	655.200	638.400	621.600	604.800	588.000
Workplace Travel/Air Travel	Air travel domestic (average)		Scope 3	361,631.00	354398.380	347165.760	339933.140	332700.520	325467.900	318235.280	311002.660	303770.040	296537.420	289304.800	282072.180	274839.560	267606.940	260374.320	253141.700

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Workplace Travel/Air Travel	Air travel long haul (business)		Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Workplace Travel/Air Travel	Air travel long haul (econ)		Scope 3	77,188.00	75644.240	74100.480	72556.720	71012.960	69469.200	67925.440	66381.680	64837.920	63294.160	61750.400	60206.640	58662.880	57119.120	55575.360	54031.600
Workplace Travel/Air Travel	Air travel long haul (econ+)		Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Workplace Travel/Air Travel	Air travel short haul (econ)		Scope 3	109,980.00	107780.400	105580.800	103381.200	101181.600	98982.000	96782.400	94582.800	92383.200	90183.600	87984.000	85784.400	83584.800	81385.200	79185.600	76986.000
Workplace Travel/Air Travel	Air travel short haul b/f class		Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Workplace Travel/Hire Cars and Taxis	Taxi (regular)		Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Workplace Travel/Staff Commuting	Air travel domestic (average)	Commuting Scope 3 Additional	Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Workplace Travel/Staff Commuting	Taxi (regular)		Scope 3	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Scope 3 TOTAL		538646.220	527653.440	516660.660	505667.880	494675.100	483682.320	472689.540	461696.760	450703.980	439711.200	428718.420	417725.640	406732.860	395740.080	384747.300
Workplace Travel/Staff Commuting	Bus travel (city)		Scope 3 Additional	46,615.00	45682.700	44750.400	43818.100	42885.800	41953.500	41021.200	40088.900	39156.600	38224.300	37292.000	36359.700	35427.400	34495.100	33562.800	32630.500
Workplace Travel/Staff Commuting	Car Medium hybrid		Scope 3 Additional	16,466.00	16136.680	15807.360	15478.040	15148.720	14819.400	14490.080	14160.760	13831.440	13502.120	13172.800	12843.480	12514.160	12184.840	11855.520	11526.200

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Workplace Travel/Staff Commuting	Company Car average (petrol)		Scope 3 Additional	51,155.00	50131.900	49108.800	48085.700	47062.600	46039.500	45016.400	43993.300	42970.200	41947.100	40924.000	39900.900	38877.800	37854.700	36831.600	35808.500
Workplace Travel/Staff Commuting	Motorcycle		Scope 3 Additional	29,663.00	29069.740	28476.480	27883.220	27289.960	26696.700	26103.440	25510.180	24916.920	24323.660	23730.400	23137.140	22543.880	21950.620	21357.360	20764.100
Workplace Travel/Staff Commuting	Private Car average (diesel)		Scope 3 Additional	127,639.00	125086.220	122533.440	119980.660	117427.880	114875.100	112322.320	109769.540	107216.760	104663.980	102111.200	99558.420	97005.640	94452.860	91900.080	89347.300
Workplace Travel/Staff Commuting	Private Car default (petrol)		Scope 3 Additional	1,451,894.00	1422856.120	1393818.240	1364780.360	1335742.480	1306704.600	1277666.720	1248628.840	1219590.960	1190553.080	1161515.200	1132477.320	1103439.440	1074401.560	1045363.680	1016325.800

Business unit	Activity	Activity Description	Scope	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
			Scope 3 Additional TOTAL		1688963.360	1654494.720	1620026.080	1585557.440	1551088.800	1516620.160	1482151.520	1447682.880	1413214.240	1378745.600	1344276.960	1309808.320	1275339.680	1240871.040	1206402.400

2.2. SIGNIFICANT EMISSIONS SOURCES

Significant sources

The second largest Scope 1 emission source after landfill is the wastewater treatment plant (WWTP) which has decreased by -1.7% against baseline, again at least partially due to the effects of COVID19. This source is substantial, because Council is effectively accounting for the entire City's wastewater emissions. A major upgrade in 2016 allowed gas from the adjacent Awapuni Landfill (previously flared) to be used to power the treatment plant, substantially offsetting the treatment plant's emissions. Council is progressing options for replacement of the WWTP. It is expected that whichever option is ultimately selected, the incorporation of modern technology and processes will result in lower emissions from the new WWTP as compared to the existing facility.

Third on the list is the Lido Aquatic Centre. A comprehensive energy audit of the site was conducted in 2016, and a range of energy saving measures implemented. Energy consumption at the site does vary dramatically depending on weather, which makes it difficult to determine precisely what impact this has had. However, comparing the 2020/21 figures to the 2015/16 baseline, we see a +45.2% increase in Scope 1 emissions has been reported at this site. Given the reported +11.9% increase in emissions compared to 2019/20 further investigation into the causes of this change are required. Further emission reductions at the Lido are likely to require substantial capital investment, and these will be considered, alongside other options, through the 'Low Carbon Fund' process.

The fourth highest source of Scope 1 emissions is from the Council's fleet of heavy trucks, which includes rubbish and recycling vehicles, transport vehicles, and miscellaneous vehicles including a single water tanker. Some progress has been made since 2018, with the incorporation of two fully electric recycling vehicles into the fleet, as well as a number of other low-emission vehicles replacing end-of-life petrol and diesel vehicles. As with the Lido, moving from emissions increases to reductions will require additional capital investment, to be considered through the Low Carbon Fund process.

Activities responsible for generating significant emissions

The largest Scope 2 emission source is electricity usage resulting from urban street lighting. An extensive LED Street Lighting upgrade programme was completed during the previous reporting period resulting in a -51.8% reduction in emissions against baseline. Since this change year on year emissions have varied very little and the relative importance of this source is primarily due to the dramatic reduction in other sources.

Scope 2 emissions at the WWTP which had increased by +5.8% against baseline in 2019/20 are reported at a -34.5% decrease in this inventory, again at least partially due to the effects of COVID19 . Again, this source is substantial because Council is effectively accounting for the entire City's wastewater emissions. The planned WWTP replacement may result in lower overall emissions from the new WWTP as compared to the existing facility but this may be reported as an increase in Scope 2 emissions due to electrification of existing Scope 1 emissions.

2020/21 Scope 2 emissions from the Lido Aquatic Centre have reduced by -12.4% against baseline which partially offsets the increase in Scope 1 emissions. It is likely that future emission reductions projects will migrate Scope 1 emissions further into Scope 2 (via electrification) with resulting reductions overall.

Influences over the activities

The largest Scope 3 emissions source on the list of Council's emissions is staff commuting, which has been voluntarily included within scope. A workplace travel survey conducted in 2020 found that, compared with the previous 2011 survey, while Council's efforts to encourage more active transport had been somewhat successful, staff commuting emissions had nonetheless substantially increased. This is due to a relatively small proportion of staff commuting much larger distances than previously, which unfortunately more than offsets the small reductions caused by some staff living locally making the switch to less carbon intensive modes. It is expected that the impact of the Covid-19 lockdown has had a substantial impact on the travel patterns of staff, so a refreshed travel survey will be conducted as part of future inventories in order to determine where the opportunities and challenges are moving forward.

Other staff travel such as taxi and air travel has dropped significantly, again at least partially due to the effects of COVID19.

Significant sources that cannot be influenced

Emissions from waste are largely unchanged however a SWAP audit and assessment completed in June 2022 revealed a significant increase in waste to landfill from the Waste Recovery Plant. This is largely due to changes in recycling collection methods and subsequent increases in contamination of recycling (i.e. non-recyclable products being placed in recycling bins).

2.3. EMISSIONS REDUCTION TARGETS

The organisation is committed to managing and reducing its emissions in accordance with the Programme requirements. Table 6 provides details of the emission reduction targets to be implemented. These are 'SMART' targets (specific, measurable, achievable, realistic, and time-constrained).

Council had previously set for itself a 25% reduction target by 2026, which it has achieved in the 2020/21 reporting period with a 27.2% reduction.

In the 2021-2031 Long Term Plan, the Council set a new citywide target (and implied organisational target) of a 30% reduction by 2031 compared to the 2015/16 baseline. With the Council's largest emission source of Awapuni Landfill continuing to mature, it seems likely that Council will achieve this target on current trends. The Council has also begun work on a carbon neutral feasibility study, which is likely to inform revised longer-term targets once completed.

Council is currently on track to achieve its GHG reduction targets, having reduced its emissions by 27.2% since the 2015/16 baseline year. If this trajectory can be maintained a 30% reduction should be achieved by the 2022/23 reporting year, seven years ahead of schedule.

Table 6. Emission reduction targets

Target name	Baseline period	Target date	Type of target (intensity or absolute)	Categories covered	Target		KPI	Responsibility	Rationale
Total Gross Scope 1, 2 and 3 mandatory emissions	July 2015 - June 2016	30/06/2031	Absolute	All categories	-30%		Absolute	Chief Executive Officer	Council citywide target as set in the 'Eco City Strategy' during 2021 LTP
Non-Landfill Gross Scope 1, 2 and 3 mandatory emissions	July 2015 - June 2016	30/06/2031	Absolute	Category 1 & 4	-30%		Absolute	Chief Executive Officer	Extension of Eco City target to Non-Landfill emissions
Emission specific 'subtargets'									
Low Carbon Fund	July 2015 - June 2016	30/06/2024	Intensity			2Tonnes	per $100	Senior Climate Change Advisor	Low Carbon Fund projects must exceed ETS spot price as a minimum criteria
Continued maturation of closed landfills	July 2015 - June 2016	30/06/2031	Intensity	Category 4	-60%		Absolute	Waste Engineer	Expected reduction based on first order decay modelling

2.4. EMISSIONS REDUCTION PROJECTS

In order to achieve the reduction targets identified in Table 6, specific projects have been identified to achieve these targets, and are detailed in Table 7 below.

Table 7. Projects to reduce emissions

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
Deliver the low carbon fund	Deliver prioritised capital works to permanently reduce Council emissions	Senior Climate Change Advisor	2024			

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
Transition to Electric Vehicles	Progressively replace fleet vehicles with electric where practical	Fleet Manager	Ongoing			
Energy Audits of Council Facilities	Sequentially audit facilities energy usage to identify opportunities to reduce energy consumption	Infrastructure Sustainability Coordinator	Ongoing			
Reduce soft plastic packaging and polystyrene	Use purchaser power to influence current suppliers to reduce non-recyclable packaging	Procurement Manager	Ongoing			
Staff Travel	Promote active transport. Provision of bikes for staff travelling to meetings, adequate parking facilities, and wet weather gear.	Transportation Planner	Ongoing			

Table 8 highlights emission sources that have been identified for improving source the data quality in future inventories.

Table 8. Projects to improve data quality

Emissions source	Actions to improve data quality	Responsibility	Completion date
Council Waste Production	Updated Waste Assessment	Rubbish and Recycling Engineer	2021/22
Staff Commuting	Update Travel Survey, post-Covid	Senior Climate Change Advisor	Completed
Taxi Travel	Obtain taxi travel data from provider	Senior Climate Change Advisor	Completed
Rented Cars	Quantify organisational rental car use	Senior Climate Change Advisor	2021/22
Freight	Quantify organisational freight use	Senior Climate Change Advisor	2021/22
Electricity and Natural Gas	Review discrepancy between reported and invoiced data	Senior Climate Change Advisor	Completed

The emissions inventory chapter identified various emissions liabilities (see Liabilities section). Table 9 details the actions that will be taken to prevent GHG emissions from these potential emissions sources.

Table 9. Projects to prevent emissions from liabilities

Liability source	Actions to prevent emissions	Responsibility	Completion date
Air conditioning units (refrigerant gasses)	Regular servicing and maintenance to prevent damage	Parks and Property Manager (via contracted services)	Ongoing
Forestry (Damage from pest plants and animals, fire)	Management of pest plants and animals in Turitea, Arapuke & Hardings Park forests. Rural fire management plan.	Water & Waste Services Manager	Ongoing
Diesel Generators & Tanks (leakage)	Monthly fuel dips & regular maintenance	Treatment Plants Manager	Ongoing

2.5. STAFF ENGAGEMENT

Additional staff resources have been employed to bring further expertise into key parts of the organisation: asset management and infrastructure delivery in particular. Asset management, project management and procurement processes are being, or have already been, reformed to bring greater emphasis on the carbon impact of various decisions. Following development of a framework and training of key staff asset management plans will now include an assessment of the estimated future carbon emissions associated with maintenance, renewal, and 'capital new' programmes.

2.6. KEY PERFORMANCE INDICATORS

Note that while PNCC's formal targets are absolute rather than relative, these revenue adjusted figures can give a sense of the scale of the change that has been achieved, with a 42% reduction in gross emissions per million dollars revenue.

Table 10. Key Performance Indicators (KPIs).

KPI	Rationale of using the additional KPI
Total gross GHG emissions per Turnover/revenue ($Millions)	
Total mandatory GHG emissions per Turnover/revenue ($Millions)	

2.7. MONITORING AND REPORTING

Energy (Electricity and Natural Gas) data is reported monthly, via SmartPower, to the Climate Change Team (CCT). Vehicle data is reported monthly, via PNCC's internal data management systems to the CCT and the Fleet Manager. Air travel data is collected by PNCC's travel providers (Orbit, House of Travel), and compiled in an annual report to the CCT. Refrigerant use is reported yearly by the refrigerant contractor to the CCT. Wastewater data is collected daily by PNCC's wastewater operations team and reported yearly to the CCT. Landfill gas emissions are estimated yearly by the CCT. Workplace commuting data is collected during the workplace travel survey, most recently completed by in Feb 2020. Council waste (from Council facilities & offices, street & park bins, the Arena, and non-recyclable products deposited in Council provided kerbside recycling bins and not identified and rejected by the streetside operational staff) is collected during the Council Facility Waste Audit, last completed in 2009, and reported to the Rubbish and Recycling Engineer and the CCT. This survey was completed again in 2022 and will be incorporated into the next inventory report.

Ultimately, all GHG emission data is the responsibility of the CCT, who report on progress to the Council and Executive Leadership Team every twelve months following external auditing.

APPENDIX 1: DETAILED GREENHOUSE GAS INVENTORY

Additional inventory details are disclosed in the tables below, and further GHG emissions data is available on the accompanying spreadsheet to this report (Appendix1-Data Summary Palmerston North City Council.xls).

Table 11. Direct GHG emissions and removals, quantified separately for each applicable gas

Category	CO_2	CH_4	N_2O	NF_3	SF_6	HFC	PFC	Desflurane	Sevoflurane	Isoflurane	Emissions total (tCO_2e)
Stationary combustion	969.19	2.02	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	971.69
Mobile combustion (incl. company owned or leased vehicles)	1,167.58	3.27	21.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,192.41
Emissions - Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Removals - Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leakage of refrigerants	1,052.80	0.00	0.00	0.00	0.00	64.71	0.00	0.00	0.00	0.00	1,117.51
Treatment of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Treatment of wastewater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions - Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Removals - Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertiliser use	0.00	0.00	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.52
Addition of livestock waste to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Addition of crop residue to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Enteric fermentation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Addition of lime to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open burning of organic matter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total net emissions	3,189.57	5.29	29.55	0.00	0.00	64.71	0.00	0.00	0.00	0.00	3,289.12

Table 12. Non-biogenic, biogenic anthropogenic and biogenic non-anthropogenic CO_2 emissions and removals by category

Category	Anthropogenic biogenic CO_2 emissions	Anthropogenic biogenic (CH_4 and N_2O) emissions (tCO_2e)	Non-anthropogenic biogenic (tCO_2e)
Category 1: Direct emissions	0.00	0.00	0.00
Category 2: Indirect emissions from imported energy	0.00	0.00	0.00
Category 3: Indirect emissions from transportation	0.00	0.00	0.00
Category 4: Indirect emissions from products used by organisation	0.00	98.92	0.00
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00	0.00
Total gross emissions	**0.00**	**98.92**	**0.00**

A1.1 REPORTING BOUNDARIES

A1.1.1 Emission source identification method and significance criteria

The GHG emissions sources included in this inventory are those required for Programme certification and were identified with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards as well as the Programme Technical Requirements.

Smartpower provide a breakdown and analysis of Natural Gas and Scope 2 emissions. Relevant staff and departments provide data on fuel and materials use (e.g. fertiliser). Operational staff maintain accessible databases for landfill and wastewater volumes. Third party providers collate data on travel (e.g. flights and taxis). Staff commuting data is gathered from voluntary survey responses.

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 Programme.

No changes to the significance criteria have been made since this inventory was initially developed in the base year.

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 as a consequence of the activities of the company but occur from sources not owned or controlled by the company.

Table 13 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 an explanation of any uncertainties or assumptions made based on the source of activity data. Detail on estimated numerical uncertainties are reported in Appendix 1.

Data is collected and compiled by officers then saved in a shared online Teams folder.

Table 13. GHG emissions activity data collection methods and inherent uncertainties and assumptions

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
INSTRUCTIONS - Please complete all applicable rows as indicated in the instructions and example. It can be helpful to re-generate the inventory spreadsheet and have it open on another screen to ensure you have not missed an emission source. Upon completing the template, ensure you delete the first 2 rows before uploading These are the overall emissions categories under ISO 14064-1:2018	These are the subcategories as outlined in ISO 14064-1, GHG Protocol or other standards. The subcategories shown with bold text contain mandatory emissions sources. Where you are not reporting any emissions against a subcategory, the relevant row may be deleted from the table.	These are the emission sources that were reported in this subcategory. Each Category has a sub total row (in light purple) in which the quantitative uncertainty for the category's emissions have been calculated.	Please describe the ways your information may have some level of uncertainty, either from the nature of the activity data, the evidence available, assumptions made, or calculations you have used. If this varies for individual emissions sources please feel free to add as many rows as required to describe each sources uncertainties. In the Category subtotal row (the light purple row), please indicate the overall level of uncertainty as low, medium, or high based on how accurate the majority of your emissions are.	Where the EF used was not the most accurate, please explain why it was not practicable to use a more accurate factor. This applies if you used a spend based or other 'average' emissions factor but another more accurate factor is available	Was any of your data pre-verified? Please indicate if any of the data presented to audit was already verified according to state methodology or a compliance scheme. If you are unsure please enquire with your account manager
e.g. Category 1: Direct emissions and removals	e.g. Direct emissions from mobile combustion	e.g. Petrol, petrol premium, diesel coming from fuel card reports, invoices and GL codes	e.g. Assumed all supplier reports are accurate and all additional fuel spent has been captured within our internal financial tracking systems. There is a higher level of uncertainty in regards to the spent based data compared to the fuel card report but it represents a smaller proportion	e.g. The internal claim for fuel process does not yet allow us to export litres of fuel used. We are working on improving our GL code categorisation and tracking methodology to report more accurately in the future	e.g. Yes - My fuel card reports are pre-verified as a 'Toitū compatible report' but the rest is not.

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Category 1: Direct emissions and removals	Direct emissions from stationary combustion	Natural Gas distributed commercial			
	Direct emissions from mobile combustion	Company Car average (petrol), Diesel, Petrol premium, Petrol regular			
	Direct fugitive emissions arising from the release of GHGs in anthropogenic systems	CH_4, N_2O, HCFC-22 (R-22, Genetron 22 or Freon 22), HFC-134a, R-410A, Wastewater precalculated (tCO_2e)			
Overall assessment of uncertainty for Category 1 emissions and removals		0%	Very low		
Category 2: Indirect emissions from imported energy	Indirect emissions from imported electricity	Electricity			
Overall assessment of uncertainty for Category 2 emissions and removals		0%	Very low		
Category 3: Indirect emissions from transportation	Business travel	Company Car average (petrol), Motorcycle, Private Car average (diesel), Private Car default (petrol), Air travel domestic (average), Air travel long haul (business), Air travel long haul (econ), Air travel long haul (econ+), Air travel short haul (econ), Air travel short haul b/f class, Taxi (regular)			

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
	Emissions from employee commuting	Car Medium hybrid, Bus travel (city)			
Overall assessment of uncertainty for Category 3 emissions and removals		0%	Very low		
Category 4: Indirect emissions from products used by organisation	Disposal of solid waste - landfilled	Waste to Landfill Municipal solid waste (CO_2e)			
Overall assessment of uncertainty for Category 4 emissions and removals		0%	Very low		
Infrastructure	Awapuni Landfill	Waste to Landfill Municipal solid waste (CO_2e)	Calculated from base assumptions and flared gas recovery rates (mod)		
Infrastructure	Wastewater Treatment	Wastewater precalculated (tCO_2e)	Calculated from M1 data (high)		
Infrastructure	Lido Aquatic Centre	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Heavy Trucks	Diesel	Measured by supplier (high)		
Infrastructure	Tankers	Diesel	Measured by supplier (high)		
Infrastructure	Utility Vehicles	Diesel	Measured by supplier (high)		
Infrastructure	Civic Administration Building	Natural Gas distributed commercial	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Customer	City Library	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Pool Vehicles	Petrol regular	Measured by supplier (high)		
Infrastructure	Light Trucks	Diesel	Measured by supplier (high)		
Infrastructure	Ashhurst Landfill	Waste to Landfill Municipal solid waste (CO_2e)	Calculated from base assumptions and flared gas recovery rates (mod)		
Infrastructure	Medium Trucks	Diesel	Measured by supplier (high)		
Infrastructure	Cemeteries	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Property	HCFC-22 (R-22, Genetron 22 or Freon 22)	Measured by supplier (high)		
Infrastructure	Ashhurst	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Tractors	Diesel	Measured by supplier (high)		
Marketing & Communications	Arena Operations	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Citywide Reserves	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Depots	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Local Reserves & Sports fields	Natural Gas distributed commercial	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Infrastructure	Nursery	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Wastewater Treatment	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Mowers	Diesel	Measured by supplier (high)		
Infrastructure	Tankers	Petrol regular	Measured by supplier (high)		
Infrastructure	Heavy Plant	Diesel	Measured by supplier (high)		
Infrastructure	Light Trucks	Petrol regular	Measured by supplier (high)		
Infrastructure	Pool Vehicles	Diesel	Measured by supplier (high)		
Customer	Mobile Library	Diesel	Measured by supplier (high)		
Customer	Youth Space	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Community Centres	Natural Gas distributed commercial	Measured by supplier (high)		
Infrastructure	Quad Bikes	Petrol regular	Measured by supplier (high)		
Infrastructure	Mowers	Petrol regular	Measured by supplier (high)		
Infrastructure	Awapuni Landfill	CH_4	Calculated from base assumptions and flared gas recovery rates (mod)		
Workplace Travel	Hire Cars and Taxis	Company Car average (petrol)	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Infrastructure	Awapuni Landfill	N_2O	Calculated from base assumptions and flared gas recovery rates (mod)		
Infrastructure	Property	HFC-134a	Measured by supplier (high)		
Infrastructure	Property	R-410A	Measured by supplier (high)		
Infrastructure	Local Reserves & Sports fields	Fertiliser use Nitrogen	Measured by supplier (high)		
Infrastructure	Parks & Reserves	Fertiliser use Nitrogen	Measured by supplier (high)		
Infrastructure	Quad Bikes	Diesel	Measured by supplier (high)		
Infrastructure	Leased Vehicles	Diesel	Measured by supplier (high)		
Infrastructure	Leased Vehicles	Petrol premium	Measured by supplier (high)		
Infrastructure	Leased Vehicles	Petrol regular	Measured by supplier (high)		
Infrastructure	Heavy Plant	Petrol premium	Measured by supplier (high)		
Infrastructure	Heavy Plant	Petrol regular	Measured by supplier (high)		
Historic Business Units	Garages	Natural Gas distributed commercial	Measured by supplier (high)		
Historic Business Units	Facilities Management	HCFC-22 (R-22, Genetron 22 or Freon 22)	Measured by supplier (high)		
Historic Business Units	Facilities Management	Natural Gas distributed commercial	Measured by supplier (high)		
Historic Business Units	Facilities Management	R-410A	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Historic Business Units	Facilities Management	R-438A	Measured by supplier (high)		
Overall assessment of uncertainty for Category 1 emissions and removals		0%	Very low		
Infrastructure	Street Lighting	Electricity	Measured by supplier (high)		
Infrastructure	Wastewater Treatment	Electricity	Measured by supplier (high)		
Infrastructure	Lido Aquatic Centre	Electricity	Measured by supplier (high)		
Infrastructure	Civic Administration Building	Electricity	Measured by supplier (high)		
Infrastructure	Water Treatment & Pumps	Electricity	Measured by supplier (high)		
Marketing & Communications	Arena Operations	Electricity	Measured by supplier (high)		
Customer	City Library	Electricity	Measured by supplier (high)		
Infrastructure	Citywide Reserves	Electricity	Measured by supplier (high)		
Infrastructure	Freyberg Aquatic Centre	Electricity	Measured by supplier (high)		
Infrastructure	Wastewater Pump Stations	Electricity	Measured by supplier (high)		
Infrastructure	Local Reserves & Sports fields	Electricity	Measured by supplier (high)		
Infrastructure	Depots	Electricity	Measured by supplier (high)		
Infrastructure	Community Centres	Electricity	Measured by supplier (high)		
Infrastructure	Ashhurst	Electricity	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Infrastructure	Stormwater Pump Stations	Electricity	Measured by supplier (high)		
Customer	Wildbase Recovery Centre	Electricity	Measured by supplier (high)		
Infrastructure	Traffic Signals	Electricity	Measured by supplier (high)		
Infrastructure	Social Housing Buildings	Electricity	Measured by supplier (high)		
Customer	Youth Space	Electricity	Measured by supplier (high)		
Customer	City Pound	Electricity	Measured by supplier (high)		
Infrastructure	City Bus Terminal	Electricity	Measured by supplier (high)		
Customer	Highbury Library	Electricity	Measured by supplier (high)		
Customer	Awapuni Library	Electricity	Measured by supplier (high)		
Customer	Roslyn Library	Electricity	Measured by supplier (high)		
Customer	Ashhurst Library	Electricity	Measured by supplier (high)		
Infrastructure	Cemeteries	Electricity	Measured by supplier (high)		
Infrastructure	Waste Management Operations	Electricity	Measured by supplier (high)		
Historic Business Units	Square Gardens	Electricity	Measured by supplier (high)		
Historic Business Units	Facilities Management	Electricity	Measured by supplier (high)		
Historic Business Units	Ashhurst Transfer Station	Electricity	Measured by supplier (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Overall assessment of uncertainty for Category 2 emissions and removals		0%	Very low		
Workplace Travel	Air Travel	Air travel domestic (average)	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Air travel domestic (average)	Calculated from M1 data (high)		
Workplace Travel	Hire Cars and Taxis	Taxi (regular)	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Taxi (regular)	Calculated from M1 data (high)		
Workplace Travel	Air Travel	Air travel long haul (business)	Calculated from M1 data (high)		
Workplace Travel	Air Travel	Air travel long haul (econ)	Calculated from M1 data (high)		
Workplace Travel	Air Travel	Air travel long haul (econ+)	Calculated from M1 data (high)		
Workplace Travel	Air Travel	Air travel short haul (econ)	Calculated from M1 data (high)		
Workplace Travel	Air Travel	Air travel short haul b/f class	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Private Car default (petrol)	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Private Car average (diesel)	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Motorcycle	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Car Medium hybrid	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Bus travel (city)	Calculated from M1 data (high)		
Workplace Travel	Staff Commuting	Company Car average (petrol)	Calculated from M1 data (high)		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Overall assessment of uncertainty for Category 3 emissions and removals		0%	Very low		
Infrastructure	Waste Management	Waste landfilled LFGR Mixed waste	Based on averaged aggregate historic data (low) (review pending)	SWAP data scheduled from June 2022 will clarify LFGR rates	
Overall assessment of uncertainty for Category 4 emissions and removals		0%	Very low		

A1.1.3 Excluded emissions sources and sinks

Emissions sources in Table 14 have been identified and excluded from this inventory.

Table 14. GHG emissions sources excluded from the inventory

Business unit	GHG emissions source or sink	GHG emissions category	Reason for exclusion
Leased Buildings	Source	Scope 2	Responsibility for these emissions lies with the tenants
Council Controlled Organisations	Source	Scope 2	Responsibility lies with the respective organisations
Embodied emissions of purchased Council products/services			Responsibility lies with the respective organisations

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

The following alternative emissions quantification approaches have been used in this inventory:

- Forest removals using programme supplied template based on growth rate lookup tables.

The quantification approach(es) has not changed since the previous measurement period

All emissions were calculated using Toitū 'emanage' with emissions factors and Global Warming Potentials provided by the Programme (see Appendix 1 - data summary.xls). Global Warming Potentials (GWP) from the IPCC fifth assessment report (AR5) are the preferred GWP conversion[5].

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.

A1.2.2 Liabilities

A1.2.2.1 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.

[5] 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.

Table 15. Land-use liabilities (total)

Site name	Total sequestration during reporting period (tCO_2e)	Contingent liability (tCO_2e)	Total potential liability (tCO_2e)
Palmerston North City Council	0	27516	1011424

A1.2.3 Supplementary results

Holdings and transactions in GHG-related financial or contractual instruments such as permits, allowances, renewable energy certificates or equivalent, verified offsets or other purchased emissions reductions from eligible schemes recognised by the Programme are reported separately here.

A1.2.3.1 CONTRACTUAL INSTRUMENTS FOR GHG ATTRIBUTES

Contractual instruments are any type of contract between two parties for the sale and purchase of energy bundled with attributes about the energy generation, or for unbundled attribute claims. This includes Renewable Energy Certificates.

n/a

A1.2.3.2 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.
- Programme approved 'pre-offset' products or services that contribute to the organisation inventory
- 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

Table 16. Significance criteria used for identifying inclusion of indirect emissions

Appendix 2
Council includes emissions which are under its operational control. That is, emissions that it recognises a responsibility and ability to influence – for example workplace travel emissions, given Council's provision of staff vehicles, bike parking, showers, etc.

APPENDIX 3: CERTIFICATION MARK USE

Certification is included in reports to Council and on our website.

APPENDIX 4: 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.

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 5: REPORTING INDEX

This report template aligns with ISO 14064-1:2018 and meet Toitū carbonreduce programme Organisation Technical Requirements. The following table cross references the requirements against the relevant section(s) of this report.

Section of this report	ISO 14064-1:2018 clause	Organisational Technical Requirement rule
Cover page	9.3.1 b, c, r 9.3.2 d,	TR8.2, TR8.3
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	TR4.14
1.3. Organisational context	9.3.1 a	
1.3.1. Organisation description	9.3.1 a	
1.3.2. Statement of intent		TR4.2
1.3.3. Person responsible	9.3.1 b	
1.3.4. Reporting period	9.3.1 l	TR5.1, TR5.8
1.3.5. Organisational boundary and consolidation approach	9.3.1.d	TR4.3, TR4.5, TR4.7, TR4.11
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	TR4.14, TR6.18
2.2. Significant emissions sources		
2.3. Emissions reduction targets		TR6.1, TR6.2, TR6.4, TR6.6, TR6.8,
2.4. Emissions reduction projects	9.3.2 b	TR6.8, TR6.11, TR6.12, TR6.13, TR6.14, TR6.15
2.5. Staff engagement		TR6.1, TR6.9
2.6. Key performance indicators		TR6.19
2.7. Monitoring and reporting	9.3.2 h	TR6.2
Appendix 1: Detailed greenhouse gas inventory	9.3.1 f, g	TR4.9, TR4.15
A1.1 Reporting boundaries		
A1.1.1 Emission source identification method and significance criteria	9.3.1 e	TR4.12, TR4.13
A1.1.2 Included emissions sources and activity data collection	9.3.1 p, q 9.3.2 i	TR5.4, TR5.6, TR5.17, TR5.18,
A1.1.3 Treatment of biogenic emissions and removals	9.3.1 g	TR4.15
A1.1.4 Excluded emissions sources and sinks	9.3.1 i	TR5.21, TR5.22, TR5.23
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 Liabilities		
A1.2.3.1 GHG stocks held		TR4.18
A1.2.3.2 Land-use liabilities	9.3.3.	TR4.19

A1.2.4 Supplementary results		
A1.2.4.1 Contractual instruments for GHG attributes	9.3.3	TR4.16, TR4.17
A1.2.4.2 Carbon credits and offsets	9.3.3.3	
A1.2.4.3 Purchased or developed reduction or removal enhancement projects	9.3.2 c	
A1.2.4.4 Double counting and double offsetting		
Appendix 2: Significance criteria used	9.3.1.e	TR4.12
Appendix 3: Certification mark use		TR3.6
Appendix 4: References		
Appendix 5: Reporting index		