

FY22 Greenhouse Gas Inventory Report

Prepared in accordance with
the Greenhouse Gas Protocol
and ISO 14064-1-2018



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Greenhouse Gas Emissions Inventory Summary

Purpose of this report and limitations

Upper Hutt City Council (UHCC) commissioned CarbonEES® to calculate its organisational greenhouse gas (GHG) inventory for its financial year 2021-2022 (FY22).

The purpose of this report is to transparently disclose UHCC's GHG emissions, how they are quantified, how UHCC is tracking towards their emissions reduction targets, and suggest further actions that UHCC can consider in their decarbonisation plan.

This report was prepared in accordance with the requirements of international standards **ISO 14064-1:2018** and the **GHG Protocol**. Using recognised and widely adopted frameworks for carbon reporting ensures transparency and consistency.

In Financial Year 2021-2022 (FY22), Upper Hutt City Council's (UHCC) total GHG emissions were **9,051, tonnes of CO₂e (tCO₂e)**, across ISO 14064-1:2018 Categories 1, 2, 3 and 4. This is an **44%** increase from FY19, UHCC's base year. **This is mostly due to a large increase in spending on building projects throughout the FY22 year, which saw emissions from contractors nearly double.**

Figure 1 shows a percentage breakdown of each emissions category. Table 1 summarises annual emissions by category. Table 2 shows the specific greenhouse gases emitted from each category. Table 3 summarises all emission sources for FY22, highlighting changes from the FY19 baseline (**which has been updated from 3,879 tCO₂e to 6,269 tCO₂e since the previous report**).

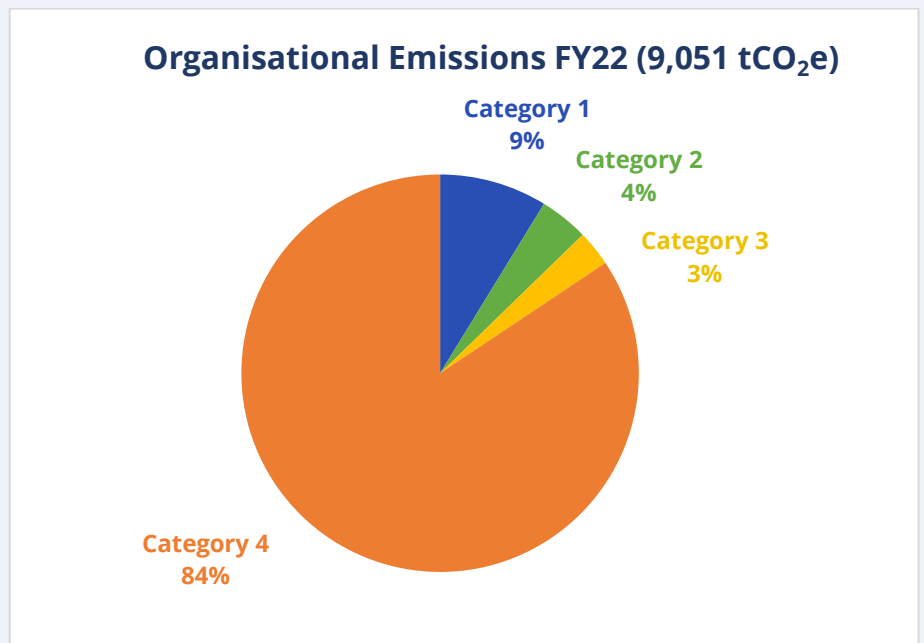


Figure 1: Overall Emissions FY22 (9,051 tCO₂e)

Table 1: Emissions trend by Category in tCO₂e with an updated FY19.

Emissions Category	FY19	FY22	Change from FY19 Baseline
Category 1	755	803	6%
Category 2	260	365	40%
Category 3	198	157	-21%
Category 4	5,055	7,725	53%
Total	6,269	9,051	44%

Emissions Category	CO ₂	CH ₄	N ₂ O	Total tCO ₂ e
Category 1	796	2	2	803
Category 2	356	8	1	365
Category 3*	123	1	3	157
Category 4*	35	46	4	7,725
Total	1,310	58	10	9,051

Table 2: Emissions by greenhouse gas in tCO₂e. * gas broken down as tCO₂e where no breakdown of the emissions factor by gas is available.

Table 3: GHG Inventory by Category in tCO₂e. Colours indicate changes from baseline FY19. NM = Not Measured*

Emissions Category	FY19 tCO ₂ e	FY22 tCO ₂ e
Category 1		
Mobile Fuel Consumption (Fleet)	102	86
Natural Gas	622	715
Refrigerants	31	3
Subtotal	755	803
Category 2		
Purchased Electricity	260	365
Subtotal	260	365
Category 3		
Downstream Freight Transportation and Distribution	NM	4
Business Travel and Accommodation	15	4
Employee Commuting and Working from Home	159	124
Upstream Emissions from Fuel Production and Distribution	24	26
Subtotal	198	157
Category 4		
Purchased Goods and Services and Capital Goods	4,955	7,640
Imported Energy Transmission and Distribution Losses	92	76
Waste Generated in Operations	8	9
Subtotal	5,055	7,725
Total	6,269	9,051

*Note: figures are rounded to nearest tonne of CO₂e straight from the data source – including totals. As such individual lines might not add to reported subtotals above. The totals and each line represent the actual data rounded to the nearest tonne.

1.0 Introduction

This report is the annual greenhouse gas (GHG) inventory report for Upper Hutt City Council (UHCC) for the period 01st July 2021 to 30th June 2022. UHCC commissioned **CarbonEES®** in February 2023 to calculate its organisational greenhouse gas (GHG) inventory for the financial year, FY22.

A GHG inventory is a list of emission sources and their associated emissions, quantified using standardised methods. The emissions included in this GHG inventory are emitted due to activities under the operational control of UHCC in FY22.

The purpose of this report is to transparently disclose these GHG emissions, how they are quantified and how UHCC is tracking towards their emissions reduction targets. This report also suggests further actions that UHCC can consider in their decarbonisation plan.

1.1 Statement of Intent

CarbonEES® is committed to preparing transparent and consistent carbon accounting and reporting in line with global best-practice. Therefore, UHCC's GHG inventory has been prepared in accordance with the requirements of ISO 14064-1:2018 and informed by the GHG Protocol.

This report specifically relates to the emissions of UHCC and has been prepared as part of their carbon reduction journey. To ensure this report is fit for purpose, UHCC has identified its intended use cases and intended users. These have been listed in Table 4 and have informed how **CarbonEES®** formulated this report.

Table 4: UHCC's Intended Use Cases and Intended Users for this GHG Inventory Report

Intended use cases of this GHG Inventory Report	Intended users of this GHG Inventory Report
- To understand UHCC's emissions profile and track the progress of the impact of future actions to reduce UHCC's organisational carbon footprint.	- UHCC officers and executive leadership.
- To communicate accordingly with staff, the public, and other stakeholders.	- UHCC Elected Members and staff.
- To prepare for the likely future introduction of mandatory reporting.	- The general public.

1.2 Description of Upper Hutt City Council

ISO 14064-1:2018, 9.3.1 (a) and 9.3.2 (a)

Upper Hutt City Council (UHCC) is a local government authority. Its mission is to enhance the quality of life in Upper Hutt by providing leadership, support, and services to the community.

1.2.1 UHCC's Decarbonisation Plan

UHCC have a goal to be a carbon neutral organisation by 2035. Actions taken since 2019 have included:

- o Removing gas as the primary energy source in the H2O Xstream refurbishment.
- o Introduced a low waste initiative aiming to divert 90% of waste from landfill.
- o Begun a sustainability capital programme of works to reduce emissions.
- o Introduced electric and PHEV vehicles into the council fleet.
- o Introduced a remote working policy.

1.3 Persons Responsible

ISO 14064-1:2018, 9.3.1 (b)

This GHG inventory was prepared by Josh McIvor at **CarbonEES®**. It was reviewed by Don MacKenzie at **CarbonEES®** and received by the Sustainability Advisor at Upper Hutt City Council. This report was written by Don MacKenzie at **CarbonEES®**.

1.4 Reporting Period Covered

ISO 14064-1:2018, 9.3.1 (c)

This GHG inventory report covers UHCC's financial year 01 July 2021 to 30 June 2022 ("FY22"). It should be noted that due to Covid-19, this period was an unusual year which has impacted emissions sources such as employee commuting.

2.0 Organisational Boundaries

ISO 14064-1:2018, 9.3.1 (d)

For an organisation to accurately report its GHG emissions, it must first establish its organisational boundary. The organisational boundary determines the parameters for GHG reporting in the UHCC inventory. This boundary refers to the legal composition of the organisation and if the organisation has any direct control over the sources of the emissions. Figure 2 illustrates the organisational boundary of UHCC.

2.1 Operational Control Approach

For this report, UHCC's organisational boundary is determined by using an operational control approach. A council using an operational control approach takes responsibility for 100% of emissions from operations it or its subsidiaries have operational control over. As such, UHCC's GHG inventory includes all sources and sinks associated with activities where UHCC has control and the full authority to introduce and implement its operating policies. Due to UHCC's responsibility to obtain and spend rate payer funds to provide essential civil services, these activities are also included, despite often being carried out by contractors. This is consistent with the operational control approach, as UHCC could implement procurement and spending policies that will inform the operational emissions from these activities.

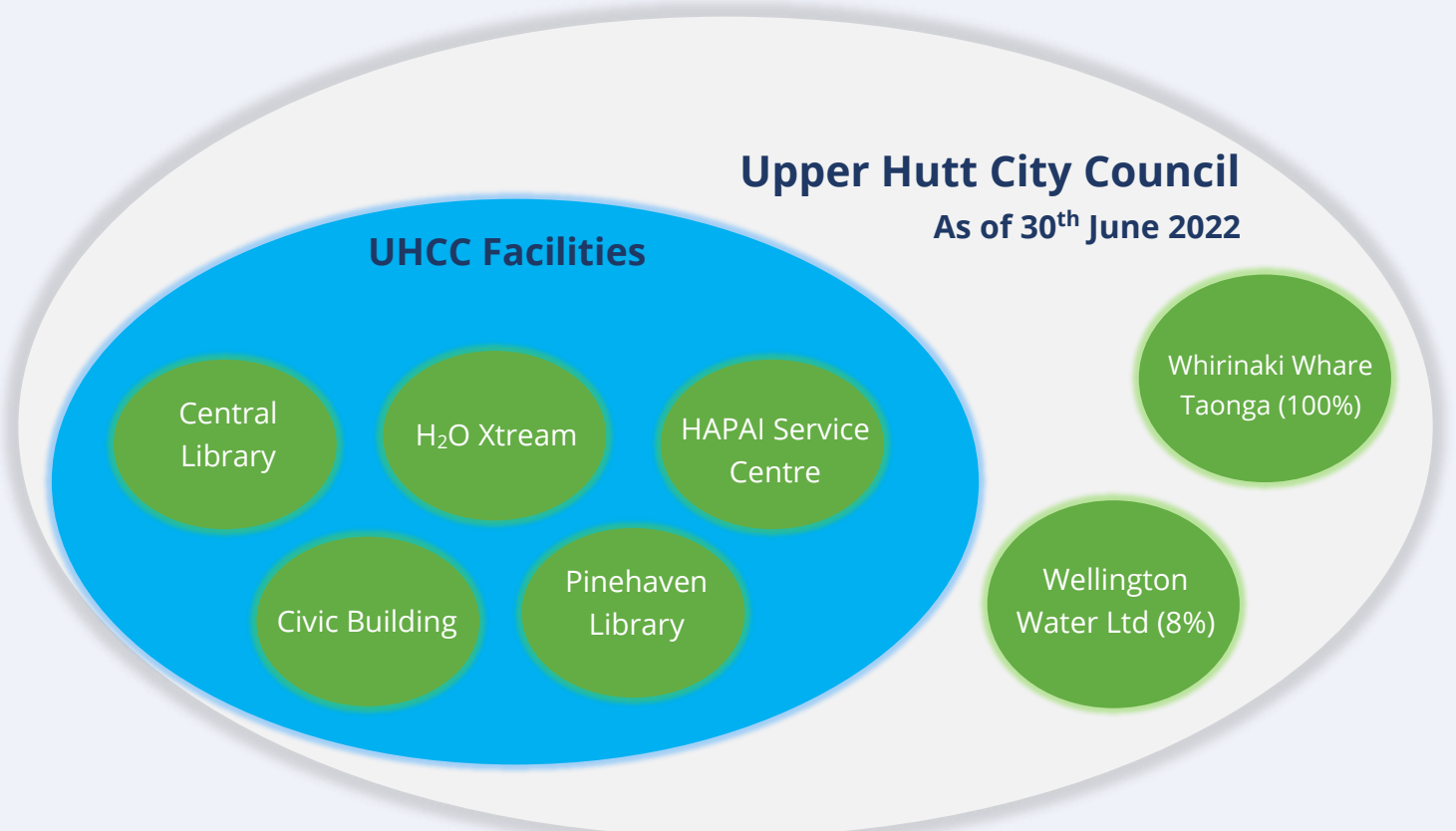


Figure 2: UHCC activities and other groups defined within the organisational boundary.

3.0 Reporting Boundaries

This section establishes and documents UHCC's reporting boundaries, including the identification of the relevant Category 1, 2, 3 and 4 emissions and removals associated with UHCC's operations.

3.1 Operational Boundaries

ISO 14064-1:2018, 9.3.1 (e)

An operational boundary was used to determine which emission sources were included and excluded in this report, and to define the significant emission sources. GHG emission sources from UHCC were identified with reference to ISO 14064-1:2018, with guidance from the GHG Protocol.

Table 5 describes the ISO 14064-1:2018 emission categories used in this report. There are two further categories; Category 5 which covers emissions from products created by an organisation; and Category 6 which covers anything not categorised under a previous category. Neither Category 5 nor 6 apply to UHCC. Categories have been used in line with the latest ISO standard, as opposed to the Scopes that were used in the baseline year report. This will not impact the emissions that fall within the boundary, only how they are divided. Categories One and Two are identical to Scopes One and Two, so the further division is that of what were previously Scope 3 emissions.

Table 5: Categories as defined by ISO 14064-1:2018.

Emission Category	Description	Example
Category 1: Direct Emissions	Direct emissions that occur from sources owned or controlled by UHCC.	The combustion of fuels in UHCC's vehicle fleet.
Category 2: Imported Energy Indirect Emissions	Emissions associated with the generation of electricity that is purchased by UHCC.	Electricity consumed at UHCC facilities.
Category 3: Indirect Emissions from Transportation	Emissions that are a consequence of UHCC's activities that result in transportation being utilised.	Air travel for business and transportation of goods by postal services.
Category 4: Indirect emissions from products used by an organisation	Emissions related to UHCC purchasing goods and services from third parties, for use in their operations.	Emissions from waste generated in operations and services such as legal services purchased by UHCC.

3.2 Information Management Procedures

ISO 14064-1:2018, 9.3.2 (i)

GHG emissions sources from UHCC were identified by **CarbonEES®** and confirmed by UHCC for this GHG inventory. As an external company, **CarbonEES®** requires confirmation from UHCC to ensure 100% of emissions are covered and accurately represent UHCC's activities.

CarbonEES® uses their software, **e-Bench®** to collect, store and manage much of UHCC's data. Activity data is either manually or automatically loaded into **e-Bench®** by data analysts at **CarbonEES®**, or automatically uploaded as part of a data activity stream. The **e-Bench®** software is programmed to ensure data is entered accurately. All data is checked for anomalies by the software and is reviewed by a data manager to ensure the data is verified. Emissions are calculated automatically within **e-Bench®** by multiplying the provided activity data by their corresponding emissions factor. UHCC can track and monitor their emissions during the year using **e-Bench®**.

If data is not entered into **e-Bench®** through the year (i.e., if the data was requested for the GHG inventory specifically), the business analysts have an internal process guideline to ensure the data is handled and stored securely. Activity data is manually prepared for the GHG inventory by business analysts, then are multiplied by the most recent and relevant emissions factors.

CarbonEES® does not get the GHG inventory data verified externally, as it is UHCC's responsibility to get their GHG inventory audited.

3.3 Significance Criteria

All identified direct emission sources were deemed significant and included. Indirect emissions sources were deemed significant and included based on the principles of completeness and transparency. UHCC looks to disclose all their indirect emissions that fall within its organisational boundary (i.e., all are considered significant), with exclusions only being permitted using the decision tree in Figure 3.

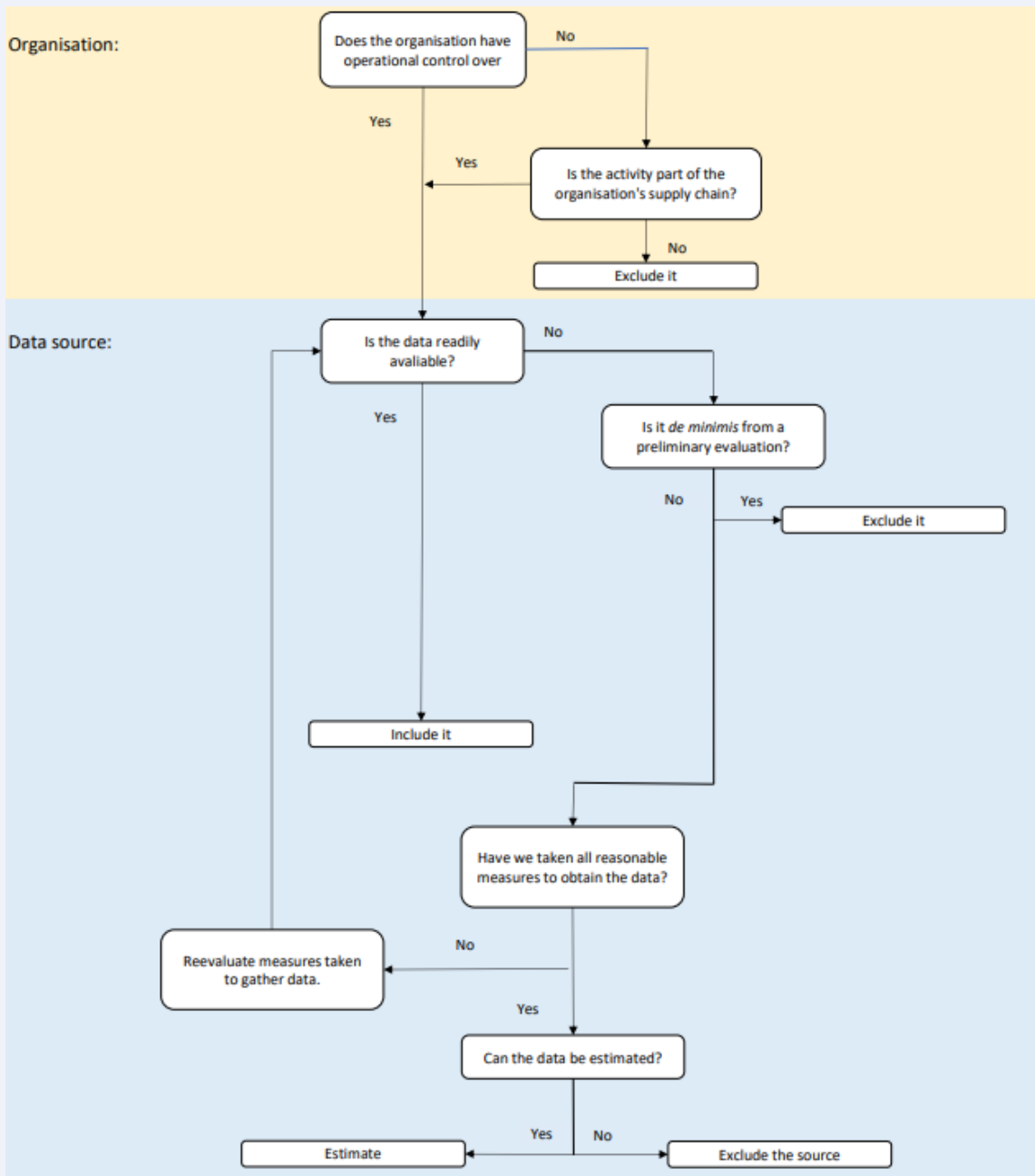


Figure 3: Significance Criteria Decision Tree

3.4 Inventory Emission Sources, Emission Factors and Activity Data

ISO 14064-1:2018, 9.3.1 (g, m, n, o, t)

Tables 6 - 10 provide a summary of the emissions sources included in UHCC's GHG inventory. The table also comments on the emission factors used, the quality of data, and who the data was provided by. Data quality was calculated using a qualitative Multi-Criteria Decision Analysis (MCDA) method, which is explained further in Appendix A.

Table 6: Category 1 Emissions Included in the GHG Inventory

Emission Category	Emission Source	Emission Factors	Data Quality	Data Provided By
Category 1 – Direct Emissions	Mobile Fuel Combustion (Fleet)	MfE (2022)	100%	Caltex (e-Bench®)
	Natural Gas	MfE (2022)	100%	Genesis (e-Bench®)
	Refrigerants	MfE (2022)	97%	George Refrigeration

Table 7: Category 2 Emissions Included in the GHG Inventory

Emission Category	Emission Source	Emission Factors	Data Quality	Data Provided By
Category 2 – Indirect Emissions from Imported Energy	Purchased Electricity	MfE (2022)	100%	Genesis (e-Bench®)

Table 8: Category 3 Emissions Included in GHG Inventory

Emission Category	Emission Source	Emission Factors	Data Quality	Data Provided By
Category 3 – Indirect Emissions from Transportation	Freight Transportation and Distribution	NZ Post (2021)	73%	Data Print/DX Mail
	Employee Commuting and Working from Home	MfE (2022)	87%	UHCC Employee Commuting Survey
	Business Travel and Accommodation	MfE (2022)	72%	UHCC
	Upstream Emissions from Fuel Production and Distribution	DEFRA (2022)	100%	Caltex (e-Bench®)

Table 9: Category 4 Emissions Included in GHG Inventory

Emission Category	Emission Source	Emission Factors	Data Quality	Data Provided By
Category 4 – Indirect Emissions from Products Used by UHCC	Purchased Goods and Services and Capital Goods	Motu (2014) MfE (2022) DEFRA (2022)	80%	UHCC/OfficeMax

Table 10: Category 4 Emissions Included in GHG Inventory continued

Emission Category	Emission Source	Emission Factors	Data Quality	Data Provided By
Category 4 – Indirect Emissions from Products Used by UHCC	Waste Generated in Operations	MfE (2022) Turner et al. (2015)	97%	UHCC
	Imported Energy Transmissions and Distribution Losses	MfE (2022)	100%	Genesis (e-Bench®)

3.5 Exclusions

Table 11 shows the emission sources that have been recognised but excluded from this GHG inventory. These sources have been deemed insignificant to UHCC, not relevant to the inventory, and/or not practically or economically viable to be measured currently.

Table 11: Emission Sources Excluded from this GHG Inventory

Emission Category	Emission Source	Reason for Exclusion
Category 1 – Direct Emissions	Fugitive Emissions from Vehicles	Not Applicable
Category 3 – Indirect Emissions from Transportation	Transportation and Distribution from NZ Post	Unable to obtain after many requests.
Category 5 – Indirect Emissions associated with the use of products from an organisation	Processing of sold products	Not Applicable.
Category 5 – Indirect Emissions associated with the use of products from an organisation	Use of sold products	Not Applicable.
Category 5 – Indirect Emissions associated with the use of products from an organisation	End-of-life treatment of sold products	Not Applicable.
Category 5 – Indirect Emissions associated with the use of products from an organisation	Downstream leased assets (i.e., assets eased to third parties).	Not Applicable.
Category 5 – Indirect Emissions associated with the use of products from an organisation	Franchises	Not Applicable.
Category 5 – Indirect Emissions associated with the use of products from an organisation	Investments	Not Applicable.

3.6 Impact of Uncertainty

ISO 14064-1:2018, 9.3.1 (p, q)

The process of preparing a GHG inventory involves a certain level of uncertainty. To reduce this uncertainty, verifiable source data has been chosen. In situations where data uncertainty persists, a cautious estimation method has been used to ensure that emissions are overestimated rather than underestimated.

The impact of uncertainty has been considered when assessing data quality. This process is qualitative and is explained further in Appendix A.

3.7 Selected Base Year

ISO 14064-1:2018, 9.3.1 (k)

The base year for UHCC is 01 July 2018 – 30 June 2019. This provides a benchmark for UHCC to compare their emissions. The total emissions for UHCC in their base year were **6,269 tCO₂e**.

It is worth noting there are some anomalies that occurred for UHCC in their baseline year, such as H2O Xstream being shut for two months, and the Central Library being shut and relocated to temporary premises for just over eight months, due to earthquake strengthening. This means the baseline year might not be a totally accurate reflection of “normal” UHCC operations.

3.8 Changes to Historic Base Year

ISO 14064-1:2018, 9.3.1 (l)

UHCC recalculate their base year if any of the following applied:

- If emission factors have changed significantly and were relevant to prior years.
- If the scope of what is measured within an inventory has changed significantly.
- If the methodology of calculating emissions from activities has changed significantly.

For UHCC’s inventory for the FY22 year, there have been significant changes, with an overall increase in emission of about 44%. The baseline year was recalculated with updated methodology used for FY22, especially around finances, to bring parity between the two years. Most of the increase is due to increase spending on contractors, largely as the result of big building projects.

4.0 GHG Emissions Calculations and Results

This section presents the results of UHCC's GHG Inventory for FY22. It offers a broad overview covering all emissions activities and categories and a detailed review of each activity or category. Within the detailed review is an explanation of each emission source.

A consistent colour scheme has been applied to emission categories. Blue indicates Category 1, Green indicates Category 2, Yellow indicated Category 3, and Orange indicates Category 4.

This section applies rounding to values to the nearest tonne of CO₂e. For more detailed figures, we encourage readers to view the accompanying GHG inventory.

4.1 Organisational emissions by category

The total organisational emissions for UHCC in FY22 were **9,051 tCO₂e**. The emissions breakdown by category is shown in Figure 4.

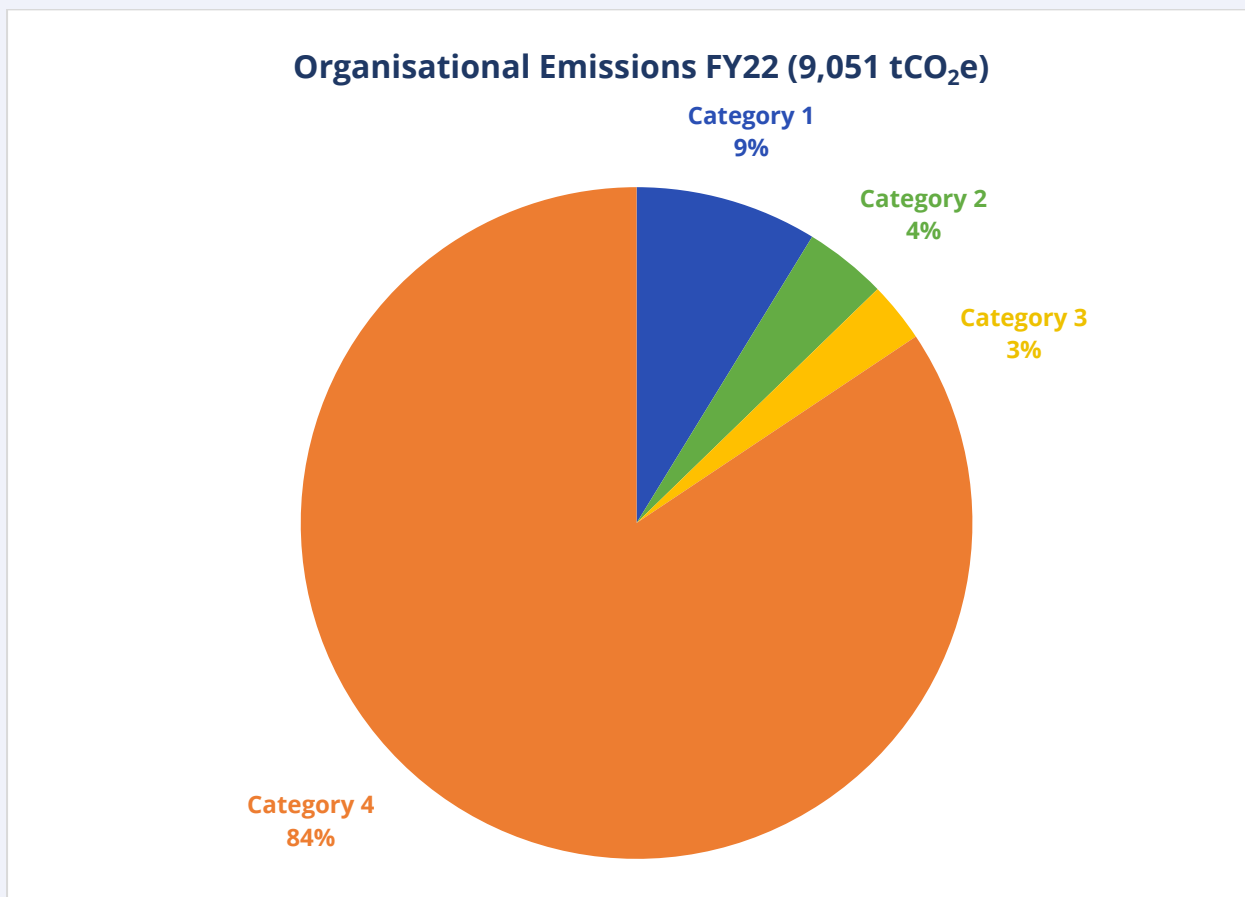


Figure 4: FY22 Organisational Emissions (tCO₂e)

The majority of UHCC's organisational emissions fall under Category 4 (84%), followed by Category 1 emissions (9%), Category 2 emissions (4%) and Category 3 emissions (3%).

4.2 Organisational emissions by activity

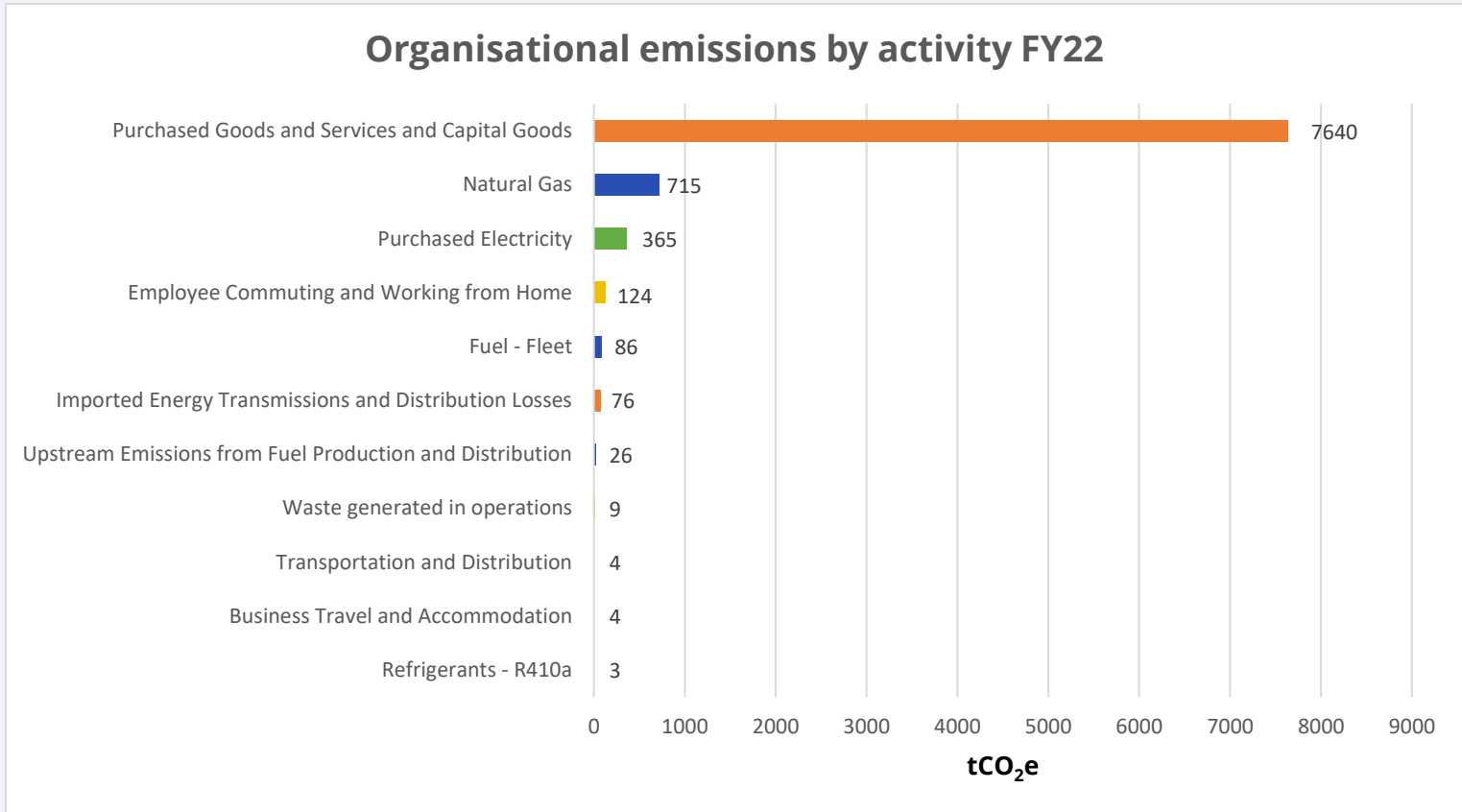


Figure 5: Organisational emissions by activity (tCO₂e). Blue bars represent Category 1 emissions; Green bars Category 2; Yellow bars Category 3; and Orange bars Category 4.

The emissions breakdown by activity is shown in Figure 5.

Most of UHCC's organisational emissions are a result of activities relating to Purchased Goods and Services and Capital Goods (84%). This is followed by Natural Gas (8%) and Purchased Electricity (4%).

4.3 Organisational emission reductions / increases

Tables 12 - 13 detail UHCC's organisational emission reductions/increases for FY22, compared to their base year FY19. In column 5 (% change from FY19 base year), red figures indicate emission increases and green figures indicate emission reduction.

Overall, UHCC's organisational emissions have increased by 44%, from 6,269 tCO₂e in FY19 to 9,051 tCO₂e in FY22.

Table 12: FY22 Emissions reductions/increases compared to base year FY19, Categories 1 & 2.

Emission Category	Emission Source	Base Year FY19	FY22	% change from FY19 base year
Category 1 – Direct Emissions	Fuel – Fleet	102	86	16%
	Natural Gas	622	715	15%
	Refrigerants	31	3	91%
Category 2 – Indirect Emissions from Imported Energy	Purchased Electricity	260	365	40%

Table 13: FY22 Emissions reductions/increases compared to base year FY19, Category 3 & 4. NM = Not Measured

Emission Category	Emission Source	Base Year FY19	FY22	% change from FY19 base year
Category 3 – Indirect Emissions from Transportation	Transportation and Distribution	NM	4	NM
	Employee Commuting and Working from Home	159	124	22%
	Business Travel and Accommodation	15	4	73%
	Upstream Emissions from Fuel Production and Distribution	24	26	6
Category 4 – Indirect Emissions from Products Used by UHCC	Purchased Goods and Services and Capital Goods	4,955	7,640	54%
	Waste Generated in Operations	8	9	9%
	Imported Energy Transmissions and Distribution Losses	92	76	18%

4.4 Category 1 Emissions

Category 1 emissions are the direct emissions that occur from sources owned or controlled by UHCC. The Category 1 activities captured in this report were fuel usage for UHCC's fleet, natural gas, and refrigerants. Category 1 emissions in FY22 (852 tCO₂e) have increased 6% when compared to UHCC's base year FY19 (755 tCO₂e). This is largely due to an increase in Natural Gas consumption. There was a decrease in fuel use, which may be tied to Covid-19 lockdowns. Figure 6 shows UHCC's organisational Category 1 emissions, while Table 14 shows the organisational Category 1 emissions reductions (green) and increases (red).

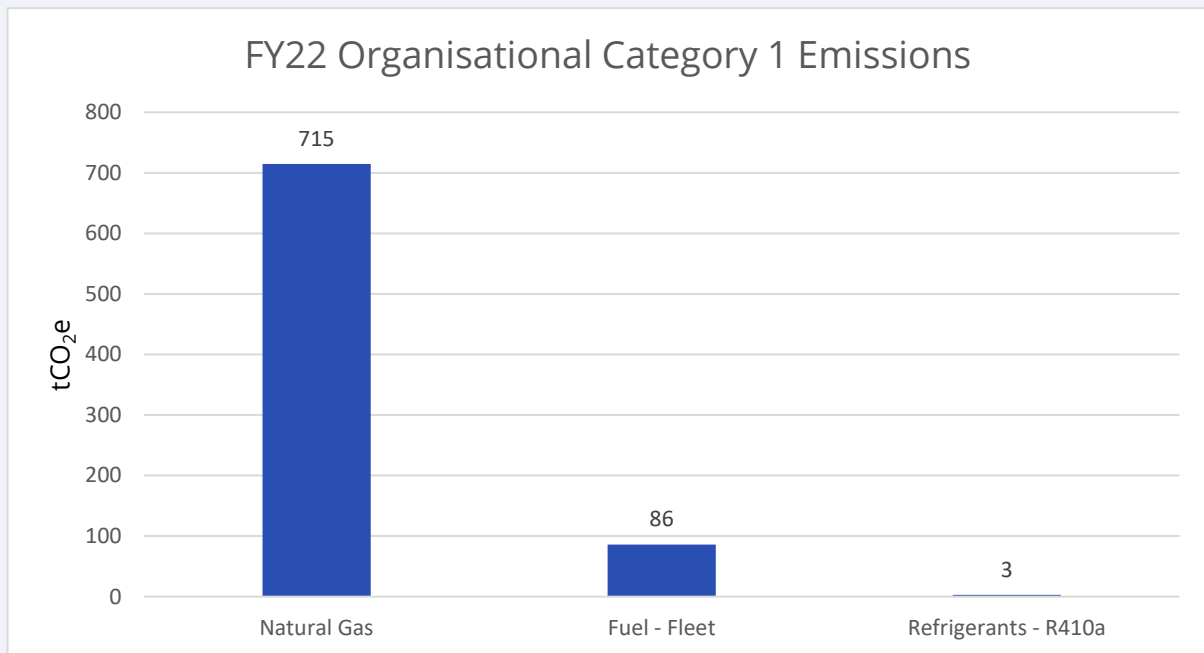


Figure 6: FY22 Organisational Category 1 Emissions (tCO₂e)

Table 14: FY22 Organisational Category 1 Emissions with further details regarding reductions/increases.

Category 1 Activity	FY22 tCO ₂ e	% of Category 1	% of Overall Emissions	% Change from FY19
Fuel - Fleet	86	11%	1%	16%
Natural Gas	715	89%	8%	15%
Refrigerants - R410a	3	<1%	<1%	91%
Total	852	-	9%	6%

4.4.1 Mobile Fuel Combustion (Fleet)

UHCC uses fuel, both petrol and diesel, in its vehicle fleet. Data has been obtained directly from Caltex.

4.4.2 Natural Gas

UHCC uses natural gas across several facilities for heating and cooking. Data was provided directly by Genesis.

4.4.3 Refrigerants

UHCC uses refrigerants in its HVAC systems across facilities. Emissions are calculated based on when refrigerants require topping up and data was provided directly by George Refrigeration.

4.5 Category 2 Emissions

Category 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although Category 2 emissions physically occur at the facility where they are generated, they are accounted for in an organisation's GHG inventory because they are a result of the organisation's energy use. In this case, Category 2 emissions are from purchased electricity (at all sites) which is used for office lighting, space heating, hot water, and appliances. Category 2 emissions in FY22 (365 tCO_{2e}) have increased by 40% compared to UHCC's base year, FY19 (260 tCO_{2e}). In part, this may be due to facilities such as H2O Xtream and the Central Library being closed for a substantial part of the baseline year. Table 15 shows the organisational Category 2 emissions reductions (green) and increases (red).

Table 15: FY22 Organisational Category 2 Emissions with further details regarding reductions/increases.

Category 2 Activity	FY22 tCO _{2e}	% of Category 2	% of Overall Emissions	% Change from FY19
Purchased Electricity	365	-	4%	40%

4.5.1 Purchased Electricity

Electricity is used at all UHCC sites for office lighting, space heating, hot water, and appliances. Electricity consumption data has been provided by Genesis Energy.

4.6 Category 3 Emissions

Category 3 emissions are indirect emissions from transportation. These are activities such as business travel, employee commuting, and freight transportation and distribution. Category 3 emissions in FY22 (157 tCO₂e) have decreased by 21% compared to UHCC's base year, FY19 (198 tCO₂e). This is in large part due to the inclusion of emission sources not measured in the base year, as well as new calculation methodologies. Additionally, working from home emissions are now included, as working from home is commonplace after the pandemic. Figure 7 shows UHCC's organisational Category 3 emissions, while Table 16 shows the organisational Category 3 emissions reductions (green) and increases (red).

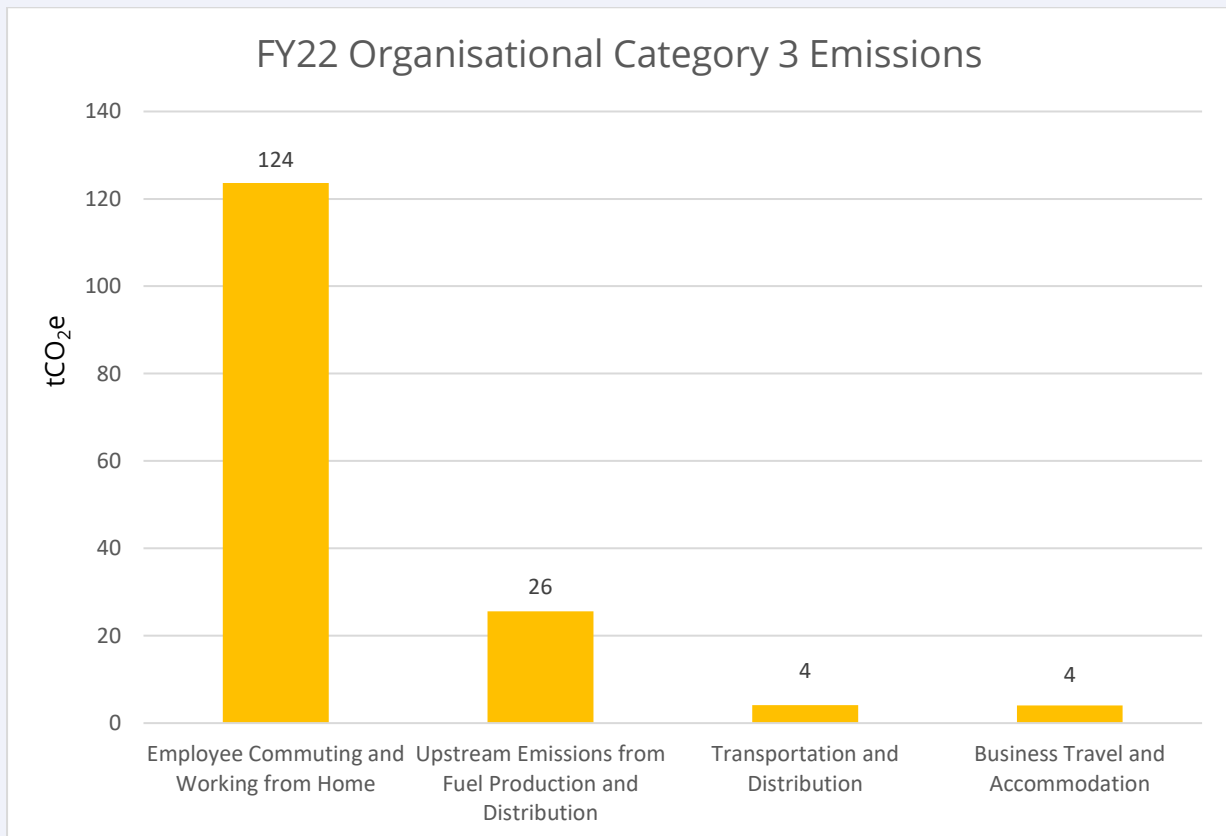


Figure 7: FY22 Organisational Category 3 emissions.

Table 16: FY22 Organisational Category 3 emissions with further details regarding reductions/increases.

Category 3 Activity	FY22 tCO ₂ e	% of Category 3	% of Overall Emissions	% Change from FY19
Employee Commuting and Working from Home	124	79%	1%	22%
Upstream Emissions from Fuel Production and Distribution	26	16%	<1%	6%
Business Travel and Accommodation	4	3%	<1%	73%
Freight Transportation and Distribution	4	3%	<1%	NM
Total	157	-	2%	21%

4.6.1 Employee Commuting

An employee commuting survey was conducted by UHCC. There were 117 respondents and figures were extrapolated out to account for FTE figures for the reporting period. Likewise, for working from home emissions, this was obtained via the employee commuting survey conducted by UHCC. Data was then adjusted to account for additional time spent working from home due to lockdowns and Covid-19 policies. Emission factors for working from home are based on average energy use for items such as laptops, a monitor, and heating are provided by MfE (2022).

4.6.2 Upstream Emissions from Fuel Production and Distribution

When an organisation uses fuel, there are emissions associated with the production and distribution of fuel, as well as the direct emissions from combusting the fuel itself. Therefore, an organisation is responsible for these upstream emission from the fuel they've purchased. Source data is the same as discussed in 4.4.1, with different emission factors being applied.

4.6.3 Business Travel and Accommodation

Some UHCC staff are required travel as part of their role. Air travel was provided by UHCC as a ledger detailing which airports were travelled between and whether the trip was return or one way. Flight distances were then calculated using an online tool (see references for link). Hotel accommodation was also provided by UHCC, extrapolated out based on air travel, where return flights on separate days indicated an overnight stay. Rental car data was a spend amount specific to petrol usage – petrol consumption was then extrapolated based on average petrol prices for the period. Business travel in personal vehicles is tracked by UHCC for reimbursement on a per kilometre basis, and these totals were provided for the report.

4.6.4 Freight Transportation and Distribution

UHCC pay for postage of goods to and from various sites and data for this activity was provided to UHCC directly by Data Print and DX Mail. Data was summarised as number of letters and number of parcels sent. Emission factors were provided by NZ Post on a per-letter and per-parcel basis. NZ Post also provides postage services for UHCC but did not respond to requests for data.

4.7 Category 4 Emissions

Category 4 emissions are indirect emissions from products used by an organisation. These include services an organisation pays for, through the course of undertaking its own activities. This category also includes waste generated by the organisation and upstream transmission and distribution losses from purchased electricity/natural gas.

Category 4 emissions in FY22 (7,725 tCO₂e) have increased by 53% compared to UHCC's base year, FY19 (4,963 tCO₂e). Figure 8 shows UHCC's organisational Category 4 emissions, while Table 17 shows the organisational Category 4 emissions reductions (green) and increases (red).

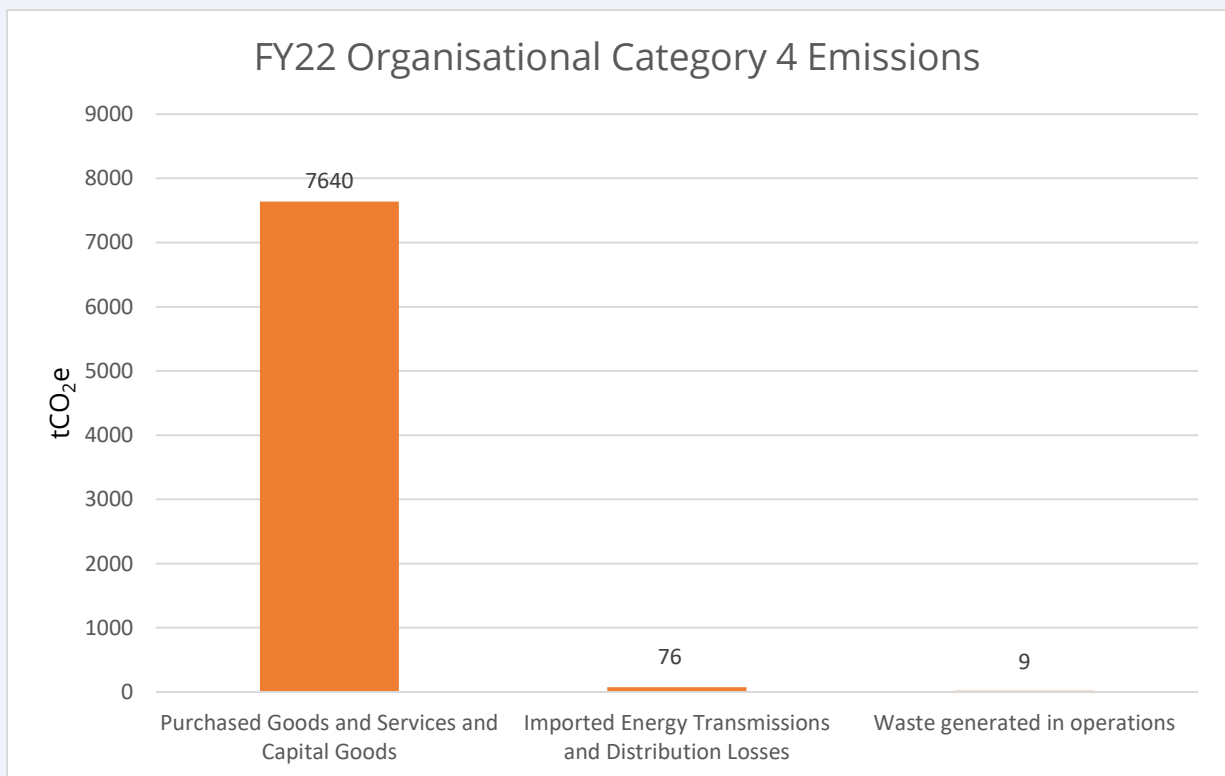


Figure 8: FY22 Organisational Category 4 emissions.

Table 17: FY22 Organisational Category 4 emissions with further details regarding reductions/increases.

Category 4 Activity	FY22 tCO ₂ e	% of Category 4	% of Overall Emissions	% Change from FY19
Purchased Goods and Services and Capital Goods	7,640	99%	84%	54%
Waste Generated in Operations	9	<1%	<1%	9%
Imported Energy Transmissions and Distribution Loss	76	1%	1%	18%
Total	7,725	-	85%	53%

4.7.1 Capital Goods

Capital goods describes financial transactions relating to the purchase and construction of fixed assets. These transactions are also referred to as capital expenditure (CAPEX) and includes expenditure on upkeep and improvements for rate payers, such as roading. For UHCC's carbon inventory, the highest emitting CAPEX was from contractors including roading (4,496 tCO₂e). Emissions from Capital Goods were derived entirely from dollar-spend reports provided by UHCC. Over time, it is expected that availability of more granular data relating to UHCC's supply chain will increase, allowing for more accurate emissions reporting.

4.7.2 Purchased Goods and Services

Purchased goods and services describes financial transactions relating to the day-to-day operations of UHCC. These transactions are also referred to as operational expenditure (OPEX) and includes all goods and services purchased by UHCC. Examples of purchased goods include staff uniforms, paper, and stationery; while examples of services include insurance, cleaning costs and legal and accounting services. The highest emitting OPEX was repair and maintenance services (989 tCO₂e).

4.7.3 Waste Generated in Operations

UHCC generates waste through its operations, including office waste and office wastewater. Weights of waste generated in operations were unable to be obtained by UHCC so they were estimated based on World Bank (2019) data, while office wastewater was estimated using an FTE figure with emission factors provided by MfE (2022).

4.7.4 Imported Energy Transmissions and Distribution Loss

When an organisation uses imported energy, such as purchased electricity, there are emissions associated with the transmission and distribution losses from the point of generation to the point of consumption. Therefore, an organisation is responsible for these upstream emissions from the imported energy they've purchased, as measurements are taken from the point of consumption. Source data is the same as discussed in 4.5.1, with different emission factors being applied. This was not included in the FY19 inventory, but emissions would increase the same as for Category 2.

5.0 Discussion

5.1 Emission Reduction Targets

UHCC have a goal to be a carbon neutral organisation by 2035. Actions taken since 2019 have included:

- o Removing gas as the primary energy source in the H2O Xstream refurbishment.
- o Introduced a low waste initiative aiming to divert 90% of waste from landfill.
- o Begun a sustainability capital programme of works to reduce emissions.
- o Introduced electric and PHEV vehicles into the council fleet.
- o Introduced a remote working policy.

5.2 Emissions Offsets

If UHCC is to meet its emission reduction targets, they will need to make substantial reductions to their emissions profiles. However, it is widely accepted that hard to eliminate emissions will remain after an organisation has endeavoured to reduce emissions as far as it can. UHCC may wish to offset some or all of its remaining emissions at some point in the future and could look at purchasing carbon credits to this end.

Alternatively, if UHCC wanted to participate in tree planting activities without having it certified they could disclose an estimate of the emissions offset the planted trees would create if they specified that the estimate has not been certified. This estimate could be included as an appendix to future GHG emissions inventories, but non-certified emission offsets should not be included in net emissions calculations.

6.0 References

- MfE (2022) - Ministry for the Environment. 2022. Measuring Emissions: A Guide for Organisations. 2022 Detailed Guide. Wellington: Ministry for the Environment.
- DEFRA (2021) - Department for Environment, Food and Rural Affairs. 2019. Greenhouse gas reporting: conversion factors 2019. United Kingdom.
- Motu (2014) - Greenhouse Gas Emissions in New Zealand: A Preliminary Consumption-Based Analysis, Motu Working Paper 14-05, Motu Economic and Public Policy Research, Wellington New Zealand.
- David A. Turner, Ian D. Williams, Simon Kemp (2015) - Greenhouse gas emission factors for recycling of source-segregated waste materials. Resources, Conservation and Recycling, Volume 105, Part A, December 2015, Pages 206-197. <https://doi.org/10.1016/j.resconrec.2015.10.026>
- RBNZ (2020) – Reserve Bank of New Zealand. Inflation calculator. <https://www.rbnz.govt.nz/monetary-policy/inflation-calculator>
- Flight Distances - https://airport.globefeed.com/New_Zealand_Distance_Between_Airports.asp
- World Bank (2018) – The World Bank. 2018. What A Waste Global Database. <https://datacatalog.worldbank.org/dataset/what-waste-global-database>

7.0 Glossary

- **Carbon Dioxide Equivalent (CO₂e)** - A standard unit for measuring carbon footprints. The impact of each different GHG is expressed in terms of the global warming potential (GWP) of one unit of CO₂. Standard ratios are used to convert gases into equivalent amounts of CO₂; these are based on each gas's GWP over a 100-year timeframe.
- **Carbon Footprint** - A measure of the amount of GHGs emitted by an organisation. Typically expressed in terms of CO₂e, and for a 12-month reporting period.
- **Emission Factor** - A metric that converts a specific emission source - such as a litre of diesel - into terms of CO₂ or CO₂e.
- **Global Warming Potential** - A measure of a gas's ability to cause radiative forcing in the atmosphere (or global warming) relative to the ability of CO₂. For example, sulphur hexafluoride has 23,900 times the GWP of CO₂, thus is 23,900 times more potent at contributing to global warming than CO₂ over a 100-year timeframe.
- **Greenhouse Gas (GHG)** - Greenhouse gases are gases that influence the way in which the Earth's atmosphere traps heat. Increasing levels of GHGs in the atmosphere are causing the phenomenon of climate change.

Appendix A: Data Quality

CarbonEES® use a Multi-Criteria Decision Making (MCDM) methodology for determining the emission data quality in carbon inventories. Each data source is rated out of 5 by asking questions in the following weighted criteria:

- **Accuracy:** How accurately does the data portray the emission activity? Is it comparable with other carbon inventories?
- **Certainty:** How certain are you that the data is accurate? Are there any estimations? What is the potential margin of error?
- **Frequency:** How frequently is the data captured?
- **Timeliness:** How well does the data capture the period measured in this inventory?
- **Completeness:** How complete is the data? Are there any gaps?

The table below shows the ratings for each emission activity under the weighted criteria and the resulting data quality.

Emission Activity	Accuracy	Certainty	Frequency	Timeliness	Completeness	Data Quality
Mobile Fuel Combustion (Fleet)	5	5	5	5	5	100%
Natural Gas	5	5	5	5	5	100%
Refrigerants	5	5	3	5	5	97%
Purchased Electricity	5	5	5	5	5	100%
Freight Transportation and Distribution	3	4	3	5	4	73%
Upstream Emissions from Fuel Production and Distribution	5	5	5	5	5	100%
Business Travel and Accommodation	3	3	5	5	5	72%
Employee Commuting and Working from Home	5	3	3	5	5	87%

Purchased Goods and Services and Capital Goods	4	3	4	5	5	80%
Waste Generated in Operations	3	3	3	5	5	70%
Imported Energy Transmissions and Distribution Losses	5	5	5	5	5	100%
UHCC GHG Inventory Average Rating	4.36	4.18	4.18	5.00	4.91	89%

Appendix B: ISO 14064-1 Reporting Index

ISO Reporting	Section in this report	ISO Reporting	Section in this report
9.3.1 (a)	1.2 , 2.2	9.3.1 (q)	3.6
9.3.1 (b)	1.3	9.3.1 (r)	1.1
9.3.1 (c)	1.4	9.3.1 (s)	3.2
9.3.1 (d)	2.0 , 2.1	9.3.1 (t)	9.0
9.3.1 (e)	3.0 , 3.3	9.3.2 (a)	1.2.1
9.3.1 (f)	Table 2	9.3.2 (b)	Not applicable
9.3.1 (g)	Not applicable	9.3.2 (c)	Not applicable
9.3.1 (h)	Not applicable	9.3.2 (d)	Not included
9.3.1 (i)	3.5	9.3.2 (e)	5.0
9.3.1 (j)	4.0	9.3.2 (f)	4.1
9.3.1 (k)	3.7	9.3.2 (g)	Not included
9.3.1 (l)	3.8	9.3.2 (h)	4.3
9.3.1 (m)	3.4	9.3.2 (i)	3.2
9.3.1 (n)	Not applicable	9.3.2 (j)	Not included
9.3.1 (o)	3.4	9.3.2 (k)	Not included
9.3.1 (p)	3.6	9.3.3	Not included