
# Greenhouse Gas Emissions Inventory Report

# FY22

# Taupō District Council

| | |
|---|---|
| For the period: | 1/7/2021 to 30/6/2022 |
| Base year: | 1/7/2018 to 30/6/2019 |
| In accordance with: | ISO 14064-1:2018 |
| Person responsible: | Gareth Green, Chief Executive |
| Prepared by: | Kevin McGrath, CoLab Energy and Carbon Manager |
| Dated: | June 2023 |
| Verification status: | Not Verified |

# Contents

# Greenhouse Gas Emissions Inventory Summary

**Table 1:** **GHG emissions data summary.**

| Emissions | FY19 (Base year) t $CO_2$-e | FY19 (recalc'd) t $CO_2$-e | FY22 t $CO_2$-e |
|---|---|---|---|
| Scope 1 (excl Forestry) | 869.6 | 870.6 | 869.6 |
| Scope 2 | 1,374.2 | 1,689.1 | 1,590.1 |
| Scope 3 (excl Waste to Landfill) | 1,185.0 | 1,325.7 | 1,461.4 |
| **Total mandatory emissions (excl LULUCF and Waste to Landfill)** | **3,428.8** | **3,885.4** | **3,921.1** |
| | | | |
| Scope 1 from Land use, Land use change and Forestry (LULUCF) | 59,595.6 | -30,837.1 | -31,226.0 |
| Scope 3 from Waste to Landfill | 45,561.4 | 29,009.4 | 25,644.5 |
| **Total gross emissions (incl LULUCF and Waste to Landfill)** | **108,585.8** | **2,057.8** | **-1,660.4** |
| | | | |
| Total mandatory GHG emissions per FTE - Full Time Employee | 9.4 | 10.7 | 13.4 |
| Total mandatory GHG emissions per Turnover/revenue ($Millions) | 40.9 | 46.4 | 24.1 |

*Notes:* *Total mandatory emissions includes scope 1, scope 2, and scope 3 (excl Forestry, Waste and incl WWTP Biogenic).*

*Base Year FY19 was recalculated using current measurement year emissions factors.*

*Forestry has been recalculated based on full forestry inventory of planted Radiata Pine 22 years and under for FY19(recalc'd) and FY22.*

**Table 2:** **Gross organisation GHG emissions by Scope for current measurement year FY22 vs FY19 (recalc'd)**

| Indicator | FY19 (Recalc'd) t $CO_2$-e | FY22 t $CO_2$-e |
|---|---|---|
| **Scope 1** | | |
| Forestry | -30,837.1 | **-31,226.0** |
| Transport fuels (Diesel, Petrol) | 750.6 | **612.1** |
| Refrigerant use | 72.4 | **219.4** |
| Fuels (LPG and natural gas) | 47.5 | **11.6** |
| Fertiliser | | **26.5** |
| **Scope 2** | | |
| Electricity | 1,689.1 | **1,590.1** |
| **Scope 3** | | |
| Waste to Landfill | 29,009.5 | **25,644.5** |
| Wastewater biogenic gases (Methane, Nitrous Oxide) | 1,097.7 | **1,309.6** |
| Transmission & Distribution Losses | 157.9 | **146.3** |
| Travel and Accommodation | 70.2 | **5.5** |
| **Total Gross Emissions** | **2,057.8** | **-1,660.4** |

**Figure 1:** **Gross organisation GHG emissions by Scope for current measurement year FY22 vs FY19 Recalc'd**

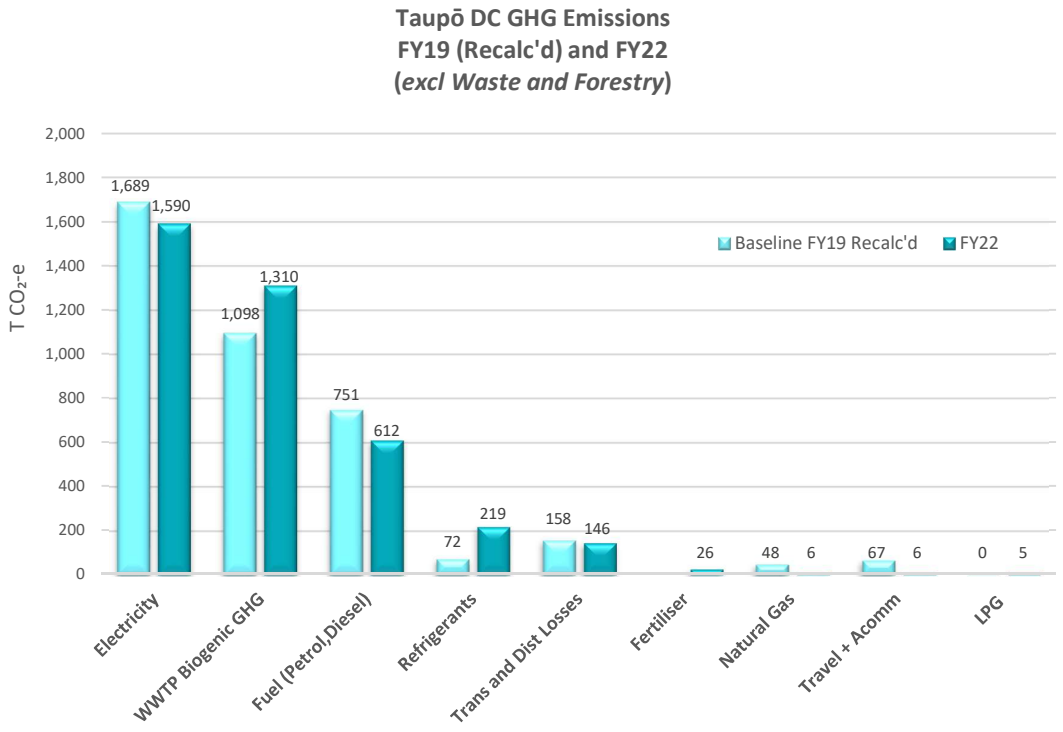


**Table 3:** **FY22 GHG emissions inventory summary by scope and greenhouse gas.**

*Note – Excludes Waste and Forestry*

| Component gas | Scope 1 | Scope 2 | Scope 3 | Total | Removals | After removals |
|---|---|---|---|---|---|---|
| **$CO_2$** | 608.9 | 1,550.2 | 147.8 | **2,306.9** | 0 | 0 |
| **$CH_4$** | 2.5 | 36.8 | 548.0 | **587.3** | | |
| **$N_2O$** | 38.8 | 3.1 | 765.7 | **807.5** | | |
| **HFC's** | | | | | | |
| **PFC's** | | | | | | |
| **$SF_6$** | | | | | | |
| **Total** | **650.1** | **1,590.1** | **1,461.5** | **3,701.7** | | |

**Table 4:** **Mobile and stationary combustion of biomass.**

| Biomass | Mass | t $CO_2e$ |
|---|---|---|
| **Biomass & Biofuels (Energy)** | 0.00 | 0.00 |

**Table 5:** **Deforestation of two hectares or more.**

| Source | Area (Ha) | t $CO_2e$ |
|---|---|---|
| **Deforestation $tCO_2e$ ($tCO_2e$)** | 0 | 0 |

**Table 6:** **GHG stock liability (see Table 13: for mass of individual gases).**

| GHG gas | Potential Liability t $CO_2e$ |
|---|---|
| **Refrigerants – nil stock stored** | 0 |
| **Diesel Fuel Tanks 2 x 1000L (Great Lakes Centre and Taupō Events Centre)** | 5.3 |
| **Total** | 5.3 |

**Table 7:** **Land-use liabilities.**

| Type of sequestration | Liability t $CO_2e$ |
|---|---|
| **Contingent liability (Forestry carbon sequestered in this reporting period)** | -31,226.0 |

**Table 8:** **Renewable electricity generation on-site.**

| Renewable generation on-site | kWh generated | t $CO_2e$ avoided |
|---|---|---|
| | Unknown | 0 |

# 1 Introduction

This report is the annual greenhouse gas (GHG) emissions inventory report for Taupō District Council. The inventory is a complete and accurate quantification of the amount of GHG emissions 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 publication Measuring Emissions: A Guide for Organisations, Ministry of Environment 2022. These requirements are based on the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) and ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

# 2 Statement of intent

This inventory forms part of Taupō District Council's commitment to measure and manage their emissions.

# 3 Organisation description

The Taupō District Council is a Local Authority that administers the Taupō District in the central North Island of New Zealand. The district stretches from the small town of Mangakino in the northwest to the Tongariro National Park in the south, and east into the Kaingaroa Forest. The region covers 6,970 km², encompasses Lake Taupō and the main towns of Taupō, Turangi and Mangakino. Council had total revenue of $163 million and employed 292 permanent staff in the financial year ending 30 June 2022.

Council's Long Term Plan for the decade ahead has a vision '*to be the most prosperous and liveable district in the North Island by 2022*'. The Summary Annual Report details a number of initiatives designed to support growth in economically efficient ways and to protect and enhance the environment. Council actively seeks to reduce their impact on the environment and are doing a number of positive Initiatives to reduce greenhouse gas emissions including:

- Having an emissions reduction directive and emissions reduction targets
- Conversion of the district street lights to LED (complete)
- Developed a Waste Management and Minimisation Plan 2018
- Diverting green waste and recycling from the landfill
- Investing and improving walking and cycling networks
- Considerable water and waste water services upgrades
- Stormwater quality improvements
- Moving to plug-in hybrid council vehicles and electric buses
- Undertaking Energy Audits at Council facilities
- Programmes for native revegetation and tree planting

# 4 Organisational boundaries included for this reporting period

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards. The GHG Protocol allows two distinct approaches to be used to consolidate GHG emissions: the equity share and control (financial or operational) approaches. We have used an operational control consolidation approach to account for emissions.

The first figure below shows the organisational structure for the Taupō District Council and its main Groups. Councillors lead high level decision-making for the organisation. The Chief Executive Officer heads the Senior Leadership Team that oversees management of the organisation and fulfilment of the decisions made by Council. The Senior Leadership Team does this by managing and co-ordinating the work of the five groups that each employ staff and contractors split into Business Units. For clarification, this inventory encompasses all of Taupō District Council activities shown in Figure 1 unless otherwise noted.

**Figure 2:** Taupō District Council organisational structure

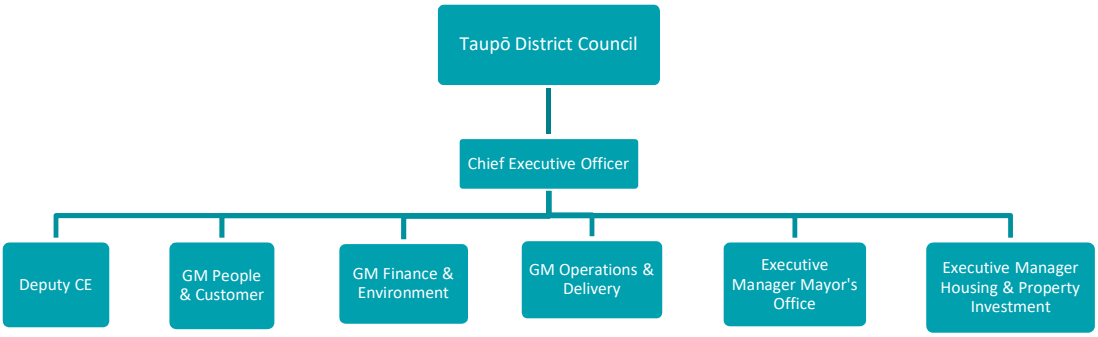



Figure 3 below shows the Taupō District Council boundary bordered by the double line. Service centres and other facilities are spread across the district in a large area.

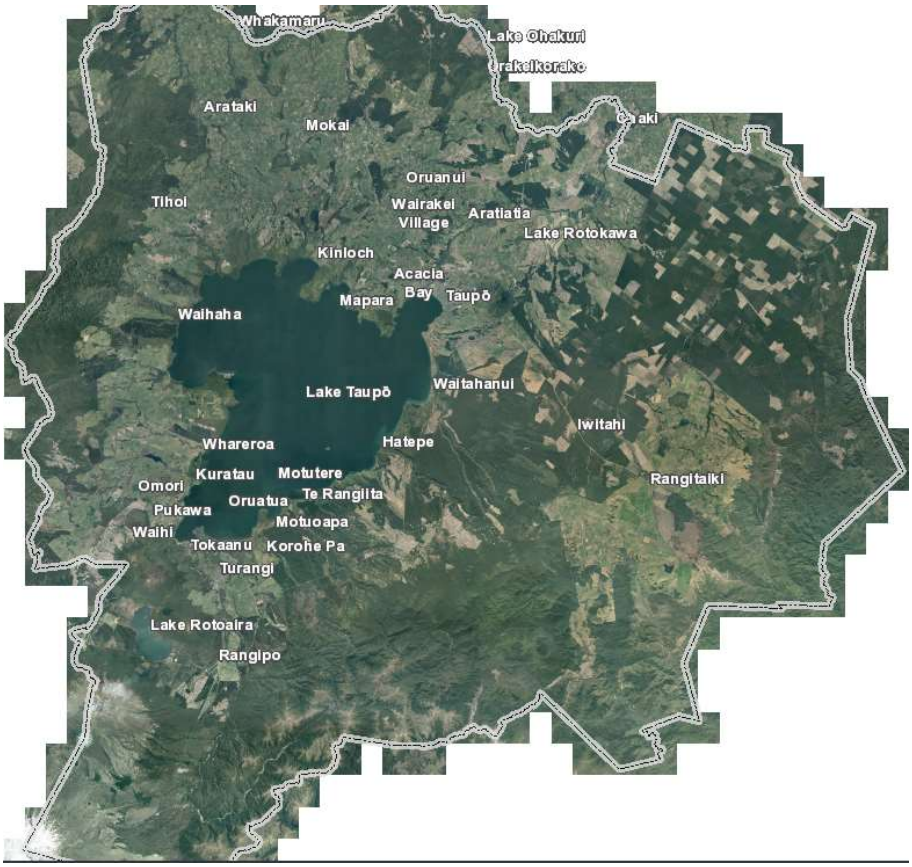



**Figure 3:** Taupō District Council region.

# 5 Organisational business units excluded from inventory

Taupō District Council has two main Council Controlled Organisations (CCO's) being:

- Destination Great Lake Taupō that is 100% owned by Council
- Taupō Airport Authority that is 50% owned by Council and 50% owned by the Ministry of Transport

Operational control is 100% divested to these CCO's therefore under the operational control model are deemed outside the inventory boundary and all GHG emissions excluded.

# 6 GHG emissions source inclusions

The GHG emissions sources included in this inventory were identified with reference to the methodology in the *GHG Protocol* and *ISO14064-1:2018* standards. As adapted from the *GHG Protocol*, these emissions were classified under the following categories:

- **Scope 1 - Direct GHG emissions: emissions from sources that are owned or controlled by the company.** Examples of Scope 1 emissions are from the combustion of fuel in the vehicle fleet, natural gas in boilers, refrigerant use and forestry.
- **Scope 2 - Indirect GHG emissions:** emissions from the generation of purchased electricity consumed by the company.
- **Scope 3 - Indirect GHG emissions:** emissions that occur as a consequence of the company's activities but from sources not owned or controlled by the company. Examples of Scope 3 emissions are business travel, freight, transmission and distribution losses and wastewater treatment.

**Table 9:** **GHG emissions sources included in the Inventory.**

| Business unit | GHG emissions source | GHG emissions Scope | Data source | Data unit | Uncertainty (description) |
|---|---|---|---|---|---|
| **All Council** | Diesel , Unleaded 91, Unleaded 95<br><br>Bulk Diesel<br><br>LPG | Scope 1 | BP fuel card reports provided by Deb Atkinson - Asset/Property/Fleet Manager.<br><br>Bulk diesel and LPG data provided by Carolyn Reid - Finance Business Partner / Financial Reporting | Lts | High level of confidence that the BP Fuel card reports are complete and accurate for fleet vehicles.<br><br>A small number of fuel and LPG purchase data was collected through financial records and should be complete and accurate. |
| **All Council** | Natural Gas | Scope 1 | Consumption report has been taken from Genesis Energy data via EnergyPro. | kWh | High level of confidence that accurate and complete data was used for all natural gas meters. |
| **All Council** | Rental Cars<br><br>Car – petrol, <2000cc | Scope 1 | Data was not available for the use of rental cars. | Days | No documentation was found relating to the hire of rental cars. There is a possibility that other business groups directly hired rental cars, however if so, this is expected to be a small number and therefore be deemed *de minimis*. |
| **All Council** | Agriculture, Forestry and other land uses (LULUCF)<br><br>The emissions are reported separately in this inventory | Scope 1 | Data was arranged by Tony Maulder TDC Property Advisor received from<br><br>Chas Hutton, NZ Forest Managers<br><br>chas@nzfm.co.nz | Ha | Data is provided by forestry management contractors is deemed to be accurate.<br><br>The data provides age and area of pinus radiata planting. |
| **Property** | Refrigerants | Scope 1 | Property Dept schedule of HVAC plant and refrigerants. Top up volumes from Andrew Hodson Superchill | kg | Property Dept provided a schedule of all HVAC/Refrig plant with refrigerant top-up volumes provided by Superchill. This is deemed to be accurate. |
| **All Council** | Electricity | Scope 2 | Consumption report has been taken from Meridian Energy data via EnergyPro. | kWh | High level of confidence that accurate and complete data was used for all electricity meters. |

| | | | | | |
|---|---|---|---|---|---|
| **All Council** | Air travel domestic (national average) | Scope 3 | Data was received from Jason Cathro - Team Leader Customer Support | Individual flights and km's travelled | It is assumed data source represents a complete and accurate account of all travel activity. However some data could be missing.<br>Flight distances were verified using airmilescalculator.com<br>No international air travel was recorded. |
| **All Council** | Accommodation | Scope 3 | Data was received from Jason Cathro - Team Leader Customer Support | Room nights and locations | It is assumed data source represents a complete and accurate account of all accommodation. However some data could be missing.<br>No international accommodation was recorded. |
| **All Council** | Waste to Landfill<br>(Note - this emission source is reported separately in the inventory) | Scope 3 | Total landfill waste volumes provided by Brent Aitken Asset Manager Solid Waste.<br>Landfill waste composition taken from Taupō District Landfill SWAP Survey 2022 | Tonnes | It is assumed data source represents an accurate account of waste volumes to landfill. Waste emissions have been calculated using constituent proportions taken from the Waste Audit with the remainder being inert waste.<br>All Council direct operations waste is assumed to be included in this data. |
| **Operations** | Wastewater Treatment Plants - Biogenic Emissions (Methane and Nitrous Oxide) | Scope 3 | Wastewater inflows for each WWTP were provided from Council records by Mike Cordell. | $m^3$ | Wastewater inflows should be accurate. Emission factors are based on the average nationwide factor for WWTPs. |
| **Operations** | Wastewater Treatment Plant biosolids (sludge) | Scope 3 | Sludge is provided to MyNoke worm farm. Sludge weights provided by Shannon McMillan. | Tonnes | Sludge disposal data has been collated from MyNoke invoices for FY22.<br>This is deemed to be accurate. |
| **Operations** | Water | | Water consumption from Council facilities | $m^3$ | This data should be collated and included in future inventories. |

# 7 GHG emissions source exclusions

Taupō District Council recognises the extent of Scope 3 emissions can be significant. We have chosen to declare the following notable emissions sources that have been excluded from the emissions inventory.

**Table 10: GHG emissions sources excluded from the inventory**

| Business unit | GHG emissions source | Scope | Reason for exclusion |
|---|---|---|---|
| **All Council** | Materials (Concrete, Steel, Aluminium) | Scope 3 | The cost and difficulty of obtaining the information was considered too high. |
| **All Council** | Working from Home | Scope 3 | No data has been collated. This is deemed to be not material. |

# 8 Data collection and uncertainties

Table 9 gives an overview of how data was collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions.

A calculation methodology has been used for quantifying the emissions inventory using emissions source activity data multiplied by emission or removal factors. All emission factors were sourced from the *Ministry for the Environment: Measuring Emissions: A Guide for Organisations. 2022 Detailed Guide.*

Additional data collection uncertainties are as follows:

- The actual volume of diesel and petrol stored in any bulk tanks on site is not measured. For the purpose of this inventory top-up volumes are known and the rated capacity of the tanks will be used for liabilities and
- Refrigeration losses and top-ups have been provided by the Mechanical Services Contractor record all volumes of refrigerants used during the reporting period. The accuracy of this is based on the records of the contractor.
- Collection of waste volumes from council facilities has not been available however emissions from all waste to the landfill is calculated and thereby will be included.

# 9 GHG emissions calculations and results

GHG emissions for Taupō District Council for the Financial Year ending June 2022 are provided in the GHG Inventory summary section at the start of this report. The Land use, Land use change and Forestry and Waste to Landfill emissions are reported separately and excluded from most Figures.

The following Figures give an overview of where the emissions are occurring across Taupō District Council. Excluding the forestry impact (LULUCF) the Waste to Landfill contributes 87% of the total TDC emissions. As such they are also reported separately.

**Figure 4:** TDC Total GHG emissions (excl Forestry).

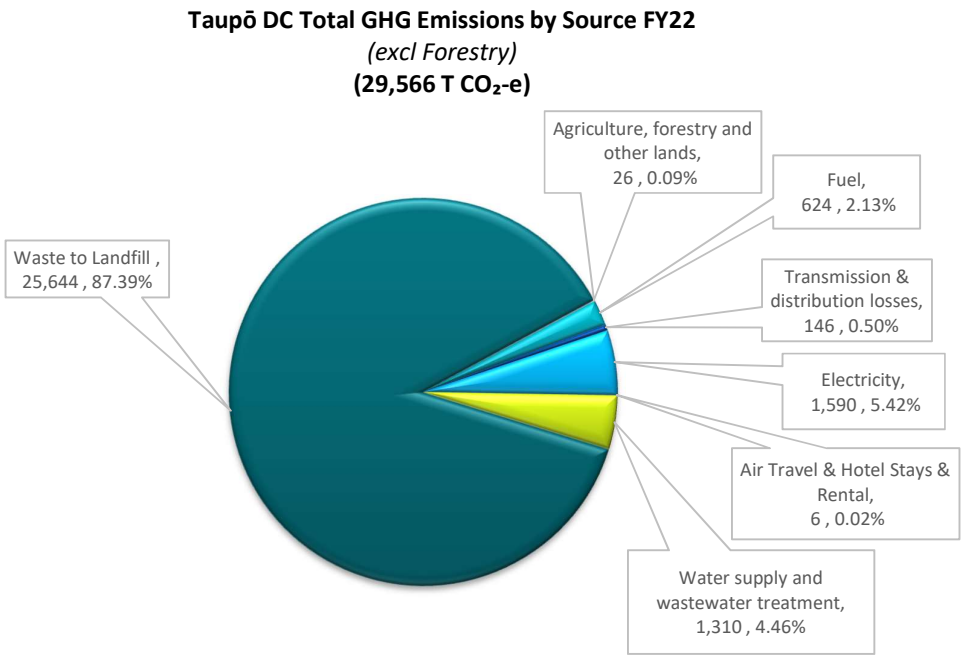



**Figure 5:** TDC GHG emissions (Excluding Forestry and Waste to Landfill).

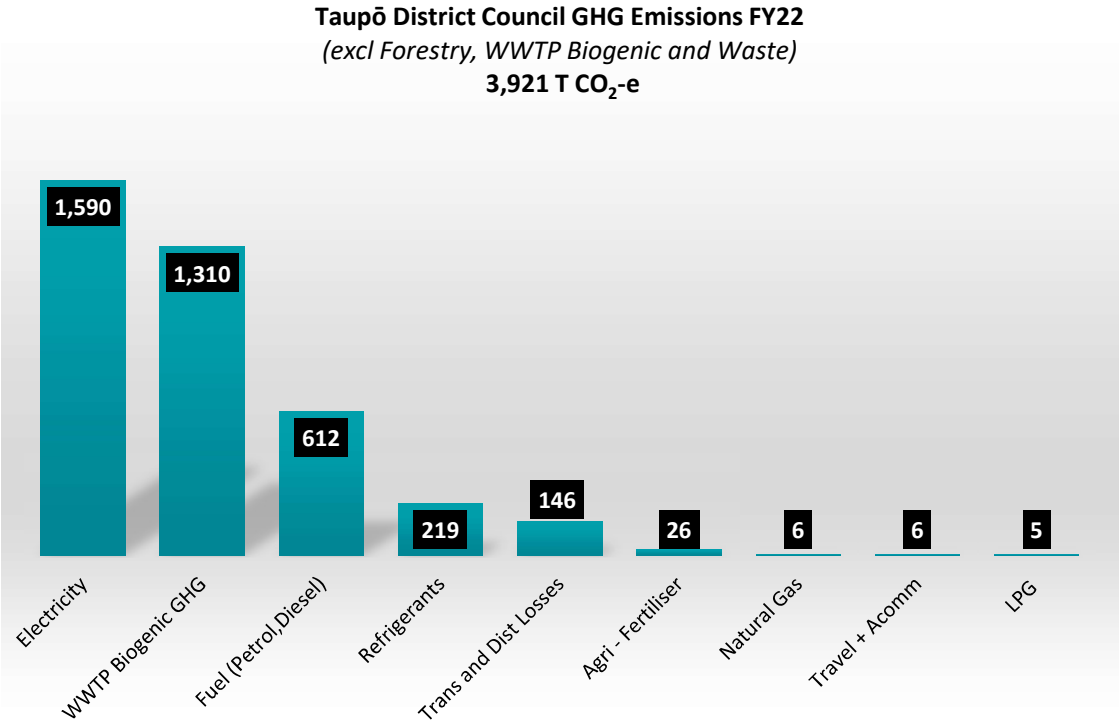


**Figure 6:** TDC GHG emissions by Scope (excl Forestry).

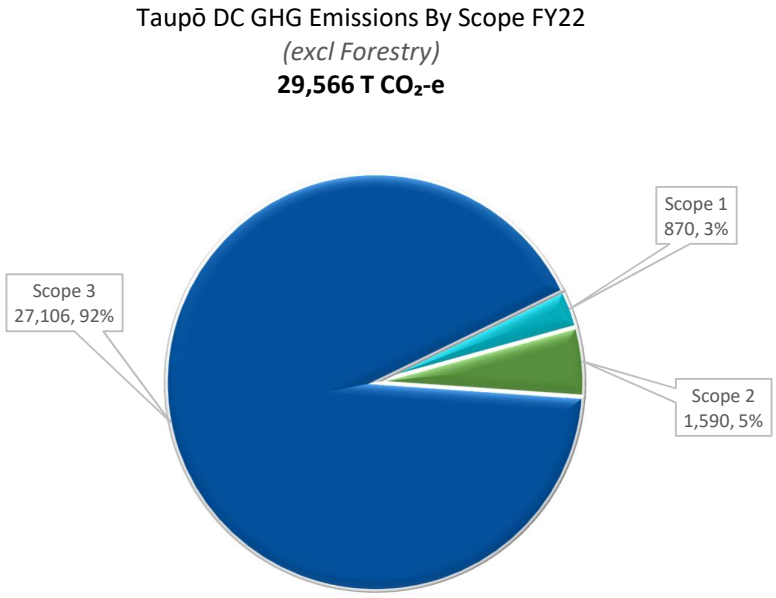



**Figure 7:** TDC GHG emissions (excl Forestry and Waste to Landfill).

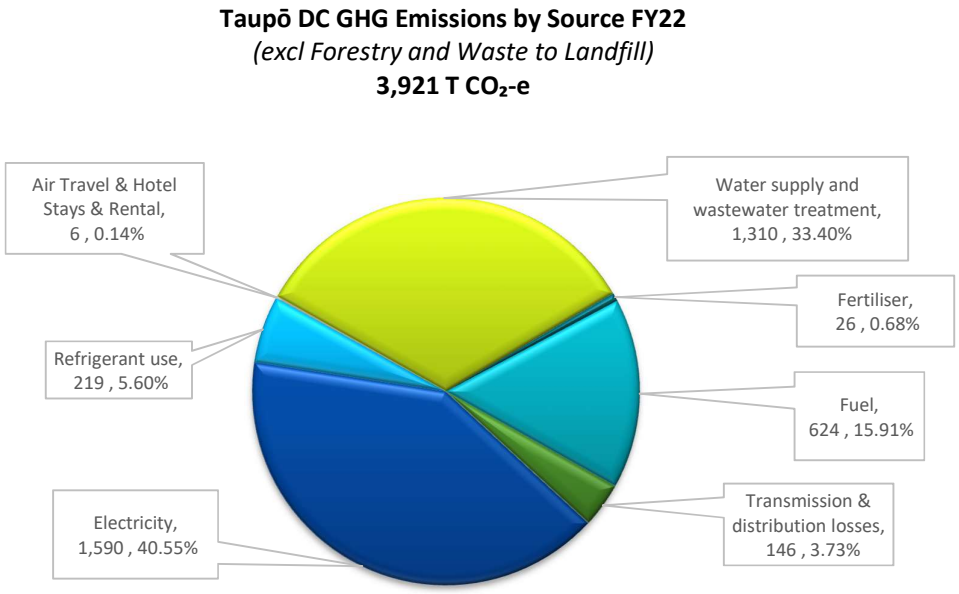


**Figure 8:** TDC GHG emissions by Scope (excl Forestry and Waste to Landfill).

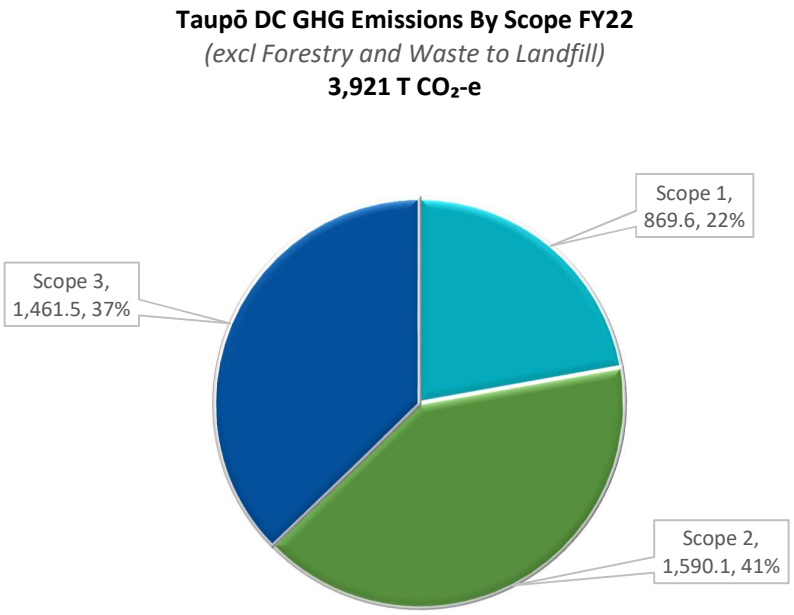
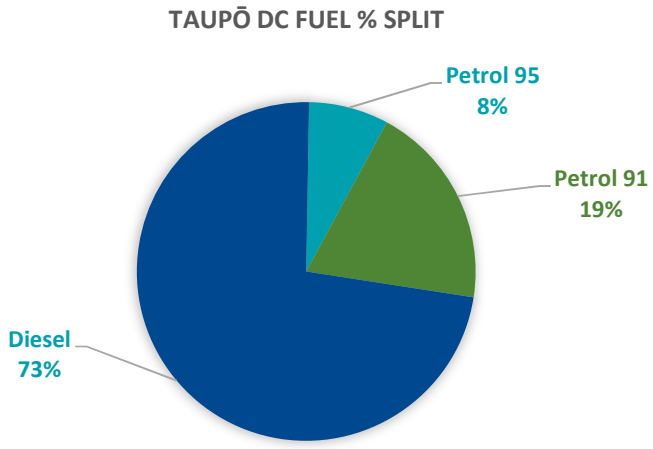



**Figure 9:** TDC Fuel Percentage Split



# 10 Liabilities

## 10.1 GHG stocks held

HFCs, PFCs and $SF_6$ represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for the reporting period. This occurred in the reporting period caused by a significant refrigerant leak at the Turangi Pools.

Any GHG stocks are included in the greenhouse gas emissions inventory summary section at the start of this report (page 6), to identify significant liabilities and implement procedures for minimising the risk of their accidental release.

**Table 11:** HFCs, PFCs and $SF_6$ GHG emissions and liabilities.

| GHG Gas | Amount held - start of reporting period | Amount held - end of reporting period | Potential Liability t $CO_2e$ |
|---|---|---|---|
| **Refrigerants** | Reported nil | Reported nil | 0 |
| **Diesel -**<br>**Generator fuel tanks at Great Lakes Ctr and Taupō Events Ctr** | 2,000 lt | 2,000 lt | 5.3 |
| **Total** | | | 5.3 |

## 10.2 Land-use, Land use change and Forestry

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. If a sequestration is claimed, this also represents a liability in future years should fire, flood or other management activities release the stored carbon.

The LULUCF sector is responsible for both emitting GHG to atmosphere (emissions i.e. through harvesting and deforestation) and removing GHG from the atmosphere (removals through planting and vegetation growth and increasing carbon stored in soils).

Taupō District Council owns plantation forestry administered by a Forestry Management company. The sequestration impact of this operation has been quantified and reported separately in this Inventory Report. It is not part of the Emissions Trading Scheme.

# 11 References


International Organisation for Standardisation ISO 14064-1:2018. Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas GHG emissions and removals.* Geneva: ISO.

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

# Appendix 1

Further GHG emissions supporting data is available from Power Solutions Ltd. The MfE Carbon Emissions Workbook used to prepare this GHG Emissions Inventory can be made available if required.