# New Plymouth District Council Corporate Carbon Footprint

2017/2018

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Prepared for – New Plymouth District Council – Co No.: N/A

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2017/2018

Client: New Plymouth District Council

Co No.: N/A

Prepared by

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# Quality Information

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| 1 | 07 May 2021 | Draft | Anthony Hume<br>Team Leader<br>Sustainability and Resilience<br>Consultant |  |

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# 1.0 Introduction

In February 2021, New Plymouth District Council (NPDC) commissioned AECOM New Zealand Limited to calculate its organisation Greenhouse Gas (GHG) inventory for the 2017/2018 financial year. This report outlines the methodology for undertaking the assessment (section 2.0) and provides the results (section 3.0).

This is the first year NPDC has undertaken corporate carbon footprinting. These results will form the baseline for subsequent reporting and will allow the organisation to report on its corporate emissions over time.

This GHG inventory is a calculated estimate of all GHGs emitted as a result of activities under the control of the Council between 1st July 2017 and 30th June 2018. This inventory includes the emissions from two Council-Controlled Organisations (CCOs): Venture Taranaki; and Papa Rererangi i Puketapu Ltd (PRIP) (New Plymouth District Airport, hereafter referred to as NPDC Airport). For the purpose of this inventory, NPDC is deemed to have control over the overall operations of these two CCOs.[1]

The objectives of this corporate carbon footprint are to:

- Provide information to the Council on their overall organisation GHG emissions
- Highlight key emission sources for future management
- Provide a standard methodology for use in future years
- Develop an improved system of carbon accounting within the organisation
- Establish a baseline year for the inventory
- Establish emissions reduction goals
- Provide the Council with information that it could use to demonstrate to key stakeholders that it is actively involved in monitoring and managing its GHG emissions.

[1] Overall control of Operations sits with GHL's Board of Directors. NPDC is the 100% shareholder


**Figure 1: New Plymouth District Council location**

# 2.0 Methodology

This section covers the methodology and approach to developing this corporate carbon footprint, including boundary definition and exclusions, emission factors, activity data and assumptions and limitations.

The assessment follows the guidelines in the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, 2004 (GHG Protocol); and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard, 2011.

In calculating this footprint, we have used an operational rather than an investment or economic approach. This approach has been taken to minimise uncertainty and produce accurate, consistent and reproducible results. We have updated this methodology based on Greenhouse gases-Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (ISO standard 14064-1:2018).

## 2.1 Organization Boundary

It is important to establish the organisation boundary when undertaking any emissions inventory. Establishing the organisation boundary identifies the scope for data collection and clarifies what information needs to be included. In this project, the organisation boundary is defined using the operational control approach. Under this approach, this emissions inventory includes all sources and sinks associated with activities where NPDC can influence. An example of this includes the introduction and implementation of strategic or operational policies.

### 2.1.1 Organisation Boundary-- Operational Control

All direct emission sources within the organisation boundary defined above are reported as Scope 1, with all remaining emissions reported as Scope 2 or 3. Table 1 below provides further explanation on the concept of scope.

**Table 1: The three scopes as defined in the Greenhouse Gas Protocol**

| | Definition | Example |
|---|---|---|
| **Scope 1** *Direct emissions* | Direct emissions that occur from sources owned or controlled by NPDC | The combustion of fuels in the vehicle fleet |
| **Scope 2** *Electricity indirect emissions* | Emissions associated with the generation of electricity that is purchased by NPDC | Electricity consumed at the water pumping stations |
| **Scope 3** *Other indirect emissions* | Emissions that are a consequence of NPDC's activities, but from sources they do not own or control | Business air travel |

Figure 2 illustrates the organisation boundaries as defined in this report. The key business unit of each group or activity is also provided below. For the purpose of this inventory NPDC is deemed to control the overall operations of two CCOs that are included within the boundary: Venture Taranaki and Papa Rererangi i Puketapu Ltd (PRIP) (New Plymouth Airport).

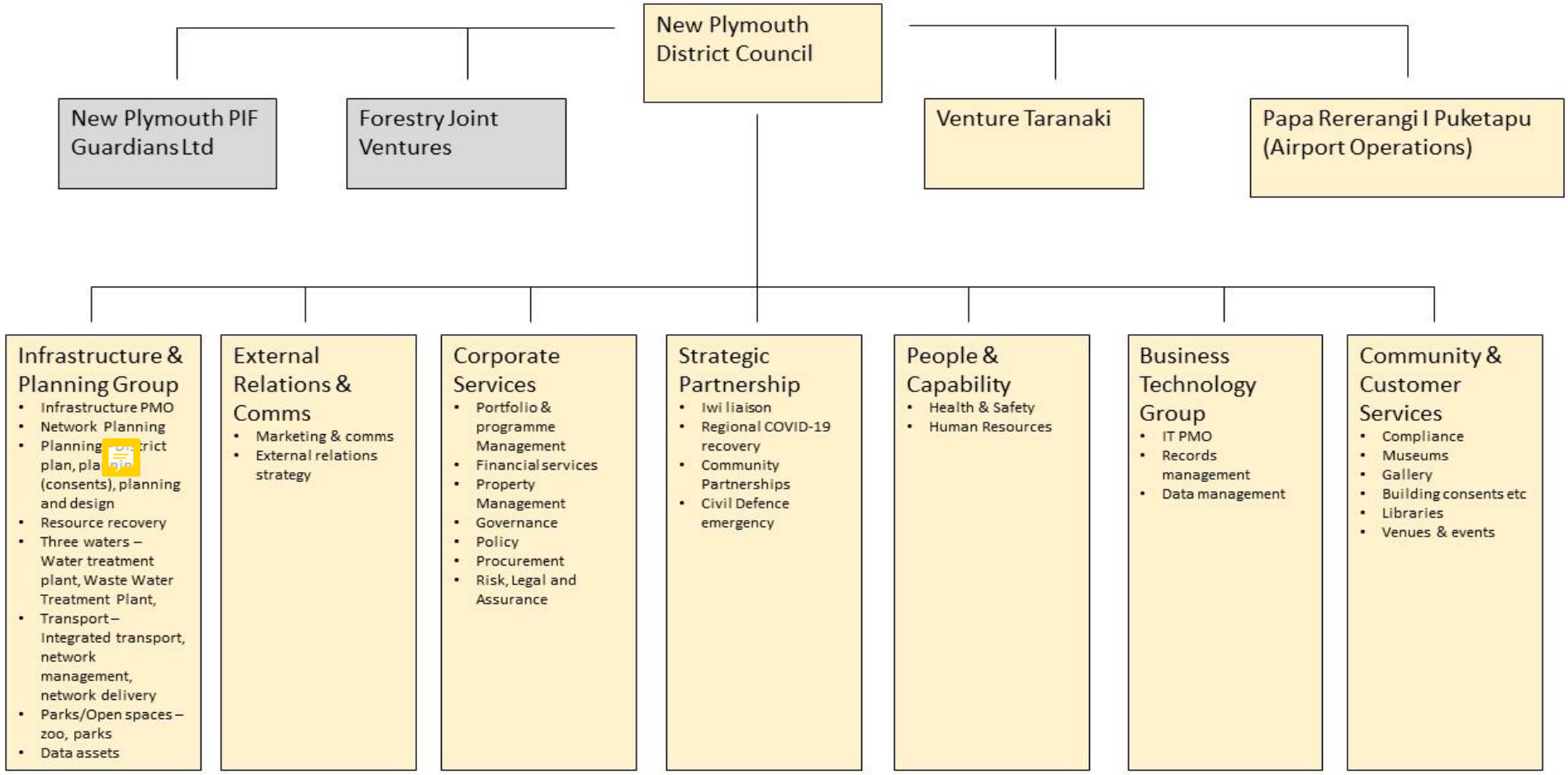



**Figure 2:New Plymouth District Council activities and organisations included in the organisation boundary by scope**

### 2.1.2 Operational Boundary Exclusions

An operational boundary defines the scope of direct and indirect emissions for operations that fall within a company's established organisation boundary. At the project kick off meeting with NPDC, potential emission sources and their inclusion in the project boundary were discussed. To determine the materiality of the various emission sources and their inclusion in the boundary, several factors were considered. These included the size of emissions, stakeholder interest, and potential reduction opportunities, as well as the ability of stakeholders to measure emissions.[2]

NPDC requested that the boundary include as many emissions sources as possible. However, not all emissions sources were able to be captured. Table 2 summarises why some emission sources were excluded from the operational corporate carbon footprint.

[2] Please refer to the NPDC Org Inventory Results 2017-2018 excel workbook for further details.

**Table 2 Emission sources excluded from NPDC footprint**

| Potential emission source | Reason for Exclusion |
|---|---|
| **Scope 1** | |
| • NPDC airport refrigerants | Sources are likely to be immaterial |
| **Scope 3** | |
| NPDC airport data – business travel, including:<br>• Public transport – air<br>• Fuel Used/Staff commute<br>• Staff Taxi/ Rental Car<br><br>*Note: Venture Taranaki water supply has been excluded* | No data available |
| **Other Scope 3** | |
| • Downstream transportation and distribution (Category 9)<br>• Processing of sold products (Category 10)<br>• Use of sold products (Category 11)<br>• End-of-life treatment of sold products (Category 12)<br>• Downstream leased assets (Category 13)<br>• Franchises (Category 14) | None identified or not applicable. |
| • Investments (Category 15) | Low materiality/insignificant source of emissions. |

## 2.2 Inventory Emission Sources, Emission Factors and Activity Data

This section describes the activities covered within each scope. It provides a brief description on each activity, referencing the source of both the activity data and the relevant emission factor. It also provides a rating of the data quality based on AECOM's data quality assessment (see Appendix B - Data Quality for details). Emission factors all include the six direct Kyoto gases ($CO_2$, $CH_4$, $N_2O$, HFCs, PFCs and $SF_6$) in accordance with requirements under the GHG Protocol (See 7.0 Glossary). Emission factors are derived from a range of sources, principally those provided in MfE (2019) and Motu (2014).

### 2.2.1 Scope 1 Direct Emissions

**Stationary Combustion (natural gas, diesel, petrol and biofuel)**

Natural gas is consumed at many of NPDC's operated locations, including wastewater treatment plants, pools, museums and libraries, stadiums and events, property and parks and reserves. In total, there are 14 identified locations where natural gas is used. It is predominantly used for heating. The New Plymouth Airport uses diesel as stationary fuel for an onsite generator. Diesel is also used for airport grounds maintenance. A small quantity is used as a lighting fuel. There were no sources of stationary petrol energy nor sources of biofuel identified. The data quality for all these sources is high, at M1.

**Refrigerants**

This covers the leakage of refrigerant gases used in both domestic-sized refrigerators and heating, ventilation, and air-conditioning (HVAC) systems used by Council operated entities. Leakage of refrigerant gases used in CCO refrigerators and freezers has been also included.

Actual quantities of leaked gases were not measured due to a lack of reliable data. Leakage rates (per equipment type) were estimates based on average leakage rates provided by MfE (2020). While leakage rates are typically quite low, the resulting emissions can be significant as refrigerants are powerful greenhouse gases with high global warming potential. For example, the global warming potential of R410a - the most used refrigerant at NPDC – is R410a. One kg of R410a emitted is equivalent to 2.088 tonnes of $CO_2$.

Refrigerant data for both the Council and Venture Taranaki (type and number of HVAC systems) was provided by NPDC and Venture Taranaki respectively. As leakage rates are only estimates, the quality of the data is of a lower quality (D1).

To increase the accuracy of subsequent corporate carbon footprints we recommend that NPDC begins collecting information on air-conditioning and chiller units. This includes collecting data on refrigerant type and charge, in addition to keeping a record of refrigerant top-ups (maintenance). This will ensure that fugitive emissions from these sources can be calculated and included in the boundary in future footprints.

**Mobile Combustion**

NPDC's fleet consists of petrol and diesel vehicles. During the inventory period, NPDC fleet vehicles ran on either diesel or unleaded petrol. Fuel consumption data has been provided by NPDC. Emission factors were taken from MfE (2020). The activity data is of a high quality (M1). Rental car use for business travel was also included under Scope 1 and data was provided directly by the client. Emission factors were taken from MfE (2020).[3]

**Waste**

NPDC has operational control over the Colson Road Landfill (in operation) and multiple closed landfills including Okato, Inglewood, Okoki Road, Oakura, Waitara, Marfell Park, Waiwhakaiho, Tongaporutu and Colson Rd stages (1 & 2). No accurate information on closed landfills is available for the district, therefore all information for closed landfills has been assumed using the national per capita breakdown. The global warming potential for these landfills has been converted from AR5 with climate carbon feedbacks to AR4. Emissions associated with these landfills have been included in Scope 1 as per the New Plymouth District Council community carbon footprint result based on the IPCC First-Order Decay model4, a model that assumes the organic, degradable component of waste decays slowly across decades, producing both CH4 and CO2.

Emissions associated with NPDC operating the New Plymouth Wastewater Treatment Plant New have also been included in Scope 1 as per the NPDC community carbon footprint result according to IPCC guidance.

### 2.2.2 Scope 2 Electricity

**Electricity**

All Electricity Data is available for electricity usage across the different NPDC operated entities including Venture Taranaki and NPDC Airport. The emission factors for electricity were taken from MfE (2020).

### 2.2.3 Scope 3 Other Indirect Emissions

Both NPDC Airport and Venture Taranaki's water consumption emissions have been excluded from this part of the inventory as no data was available. Further detail on other scope 3 emission that have been excluded are summarized above in Table 2.

**Business Travel - Air Travel**

Air travel data has been sourced from the South Pole Carbon Emission report as provided by the client. It has been categorised by 'Domestic', 'Short Haul International' and 'Long Haul International'.

[3] The quality of the data is low quality (D1).
[4] https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/5_1_CH4_Solid_Waste.pdf

Airport data was also provided for Venture Taranaki. The distance was based on Toitu's flight calculator.[5]

The emissions factors applied to this data have been sourced from MfE (2020). In accordance with recommendations from MfE, we have used emission factors with radiative forcing. This is to compensate for indirect flight routes, circling and delays.[6] While this figure is not likely to be accurate in every situation, it is a conservative approach in the absence of more specific information. Emissions associated with a given flight will be dependent on variations in aircraft type, fuels used, weather conditions, flight paths and loads.[7]

**Business Travel - Taxis, Private mileage claims and Accommodation**

NPDC provided dollar values of taxis and private mileage spend. Venture Taranaki also provided dollar values of both taxi and rental bus spend. Both NPDC and Venture Taranaki provided the dollar value of money spent on business accommodation.

However, to calculate emissions accurately, the number of room nights stayed in hotel accommodation is needed rather than the dollar value spent. We estimated the number of nights for both entities based average dollar spend per night. For NPDC we used an average of 165NZD per night; for Venture Taranaki, we used an average of 178NZD per night. Staff private vehicle mileage claims in in dollars spent was provided by the NPDC.

Emission factors were taken from MfE (2020). The activity data is of a lower quality (D1).

**Employee Commuting**

Employee commuting data has been sourced through a staff survey conducted by NPDC in 2019. 17/18 FTE numbers were used to apply this commuting data to the 17-18 time period. This data was used to estimate the GHG emissions associated with employee travel to and from work during the reporting year.[8]

**Transmission and distribution losses for electricity & gas**

The emissions factors used for transmission and distribution losses from electricity and gas consumption from both NPDC and CCOs are based on national average figures for electricity and natural gas lost in the transmission and distribution network provided by MfE (2020).

**Waste**

Waste generated in operations has been broken down to general waste to landfill, mixed recycling and recycled food waste. Data was provided by Waste Management (the Council's waste service provider) in kilograms. The activity data is of a high quality M1.

Although recycled food waste data was provided, we are unsure if this relates to composting occurring at either a council-controlled or alternative waste management site. We have assumed this recycled food waste is being dealt with offsite and have included it in Scope 3.

Further information is needed from waste management to clarify these food-related emissions. We will endeavor to include this in the final report once we have attempted to source further information from Waste Management. Council green waste or composting was not included in the calculation due to lack of readily available data. Data for composting operations should be collected in future measurements of corporate emissions.

[5] https://calculator.toitu.co.nz/?calculator=travel.
[6] For reference please see page 59 of MfE (2020) pg 59.
[7] The quality of activity data is M1.
[8] Emission factors were taken from MfE (2020). The quality of activity data is E1.

### Water Supply

Water supply data used from Council operations was provided by NPDC.[9] This water supply data is distinct from wastewater as a source as it the water that is used by Council operations. It is useful for NPDC to report on this number independently of the corporate carbon footprint to track water consumption across Council operations, as it is difficult to track water consumption from wastewater outflow only. The total water consumption is 185,585 $m^3$ per year.To prevent double counting of emissions from water supply and wastewater emissions from water supply is not included in the total calculations but is included in emissions from wastewater.

### Purchased Goods and Services (Cat 1), Capital Goods (Cat 2), Upstream Transportation and Distribution (Cat 4) & Upstream Leased Assets (Cat 8)

Under Cat 1 Purchased Goods and Services emissions sources were included such as office paper, contractors used for professional services, fleet and plant consumables and maintenance and chemicals use.[10]. Estimated emissions under these categories were calculated using the Motu (2014) emissions factors for average industry sectors and activities in New Zealand.

Activity data (dollar spend information) for Cat 2 capital goods was extracted from the general ledgers of the Council. Estimated emissions under these categories were calculated using the Motu (2014) emissions factors for local government administration, except for library services that had its own specific emission factor.[11]

Emissions associated with courier and postage was included for both NPDC and the two CCOs under Upstream transportation and Distribution The data quality was E1 where courier and postage cost data was directly provided and E3 where the cost was estimated based on an FTE ratio. These emissions are included under Downstream transportation and distribution (Cat 9).

Emissions associated with the lease of operating premises, including a library, land and sports ground has been included within Upstream Leased Assets (Cat 8). The data quality for this category is E1.

## 2.3 Inventory Auditing

The emission inventory was completed using the guidance of ISO 14604-1 and 2018- ISO 14604-1,2018, but the inventory is unverified. Some parts of the inventory may need further work for verification. For example, scope 3 emissions may need to the CCO be added to the current inventory. Refrigerants may also need more accurate data to pass the verification process. We also recommend the client retain all records associated with creation and maintenance of this corporate carbon footprint for the purposes of inventory auditing.

If the Council is seeking verification, the Council must use a verification body that meets the requirements described in ISO 14064-3. Requirements for the competence of validation teams and verification teams are described in ISO 14066.

## 2.4 Assumptions and Limitations

For a full list of all assumptions and limitations in relation to each source, please see the ‘Notes’ column for each emission source under NPDC Org Inventory Results 2017-2018 excel workbook.

[9] Emission factors were taken from MfE (2020). The activity data is of a high quality M1.
[10] Within this category there are different data sources and the data quality of each source is E1.
[11] The quality of this data is robust and all emission sources are rated as D1.

# 3.0 Emissions Summary

This section presents the results of the NPDC corporate carbon footprint. It provides:

- a broad summary covering all activities
- an outline of the corporate emissions
- a focus on each of the key emission sources.

Emissions are presented in carbon dioxide equivalent ($CO_2e$), a standard unit for measuring and reporting greenhouse gas emissions.

## 3.1 All Activities and Groups

In 2017/18, NPDC's carbon footprint is estimated as 94,484,988 kg $CO_2e$. Table 3 provides a summary breakdown of all the emissions included in the carbon footprint. The largest source of emissions was the operational landfill which contributed 44,399,988 kg $CO_2e$. Note that percentages reported on in this report have been reported on to zero decimal points, while the below table accounts for two decimal points to allow for further detail around smaller emissions sources.

The total gross emissions excluding the CCOs is 94,411,051 kg $CO_2e$ which is 170,489 kg $CO_2e$ per Full Time Equivalent (FTE) employee. Note that operational water supply for the Council has not been included in the total calculation as it is already included within wastewater discharges; to include this would essentially be double-counting The total gross emissions including the CCOs is 94,484,988 kg $CO_2e$. This equates to 27,979 kg $CO_2e$ for the NPDC airport and 276,643 kg $CO_2e$ for Venture Taranaki.

**Table 3: Inventory Summary**

| Source | kg $CO_2e$ | % of total | % of Total not including closed landfill |
|---|---|---|---|
| **Scope 1** | **58,320,981** | | **58,118,249** |
| Refrigerants | 873 | 0.00% | 0.00% |
| Natural (reticulated) Gas | 2,658,520 | 3.37% | 4.54% |
| Fleet Petrol | 171,935 | 0.22% | 0.29% |
| Fleet Diesel | 256,756 | 0.33% | 0.44% |
| Landfill-closed landfill | 20,377,838 | 25.82% | |
| Landfill- operational landfill | 34,631,991 | 43.89% | 59.16% |
| Waste Water Treatment Plant (WWTP) | 202,732 | 0.26% | 0.35% |
| CCO VT Rental car | 110 | 0.00% | 0.00% |
| CCO VT Refrigerants | 202 | 0.00% | 0.00% |
| CCO VT Fleet petrol | 17,606 | 0.02% | 0.03% |
| CCO Airport Fleet petrol | 75 | 0.00% | 0.00% |
| CCO Airport Fleet Fuel diesel | 1,521 | 0.00% | 0.00% |
| CCO Airport Diesel Generators | 210 | 0.00% | 0.00% |
| CCO Airport Other stationary fuel | 610 | 0.00% | 0.00% |
| **Scope 2** | **1,628,356** | | **1,628,356** |
| Electricity | 1,601,899 | 2.03% | 2.74% |
| CCO VT Electricity | 3,966 | 0.01% | 0.01% |

| Source | kg $CO_2e$ | % of total | % of Total not including closed landfill |
|---|---|---|---|
| CCO Airport Electricity | 22,491 | 0.03% | 0.04% |
| **Scope 3** | **18,965,868** | | **18,965,868** |
| Business Travel (air travel, taxis and accommodation) | 117,940 | 0.15% | 0.20% |
| Employee Commuting | 328,507 | 0.42% | 0.56% |
| T&D Loss Electricity & Gas | 256,548 | 0.33% | 0.44% |
| Operational Waste to landfill-General waste | 3,673 | 0.00% | 0.01% |
| Operational Food recycling | 1,378 | 0.00% | 0.00% |
| Operational Mixed recycling | 35 | 0.00% | 0.00% |
| Purchased Goods & Services | 10,593,391 | 13.42% | 18.10% |
| Capital Goods | 7,285,669 | 9.23% | 12.45% |
| Upstream Transportation | 73,857 | 0.09% | 0.13% |
| Upstream Leased Assets | 47,710 | 0.06% | 0.08% |
| CCO VT Purchased Goods and Services | 226,528 | 0.29% | 0.39% |
| CCO VT Capital Goods | 4,157 | 0.01% | 0.01% |
| CCO VT Business Travel | 13,392 | 0.02% | 0.02% |
| CCO VT Employee Commuting | 9,797 | 0.01% | 0.02% |
| CCO VT T&D Loss Electricity | 341.27 | 0.00% | 0.00% |
| CCO VT Upstream Transportation and Distribution | 543 | 0.00% | 0.00% |
| CCO Airport Upstream Transportation and Distribution | 200 | 0.00% | 0.00% |
| CCO Airport T&D Loss Electricity | 1,935.49 | 0.00% | 0.00% |
| CCO Airport Waste | 265.01 | 0.00% | 0.00% |
| **Total** | **78,915,205** | 100% | 100% |
| **Total excluding CCO** | **78,841,938** | | |
| **Total excluding closed landfill** | **58,537,367** | | |

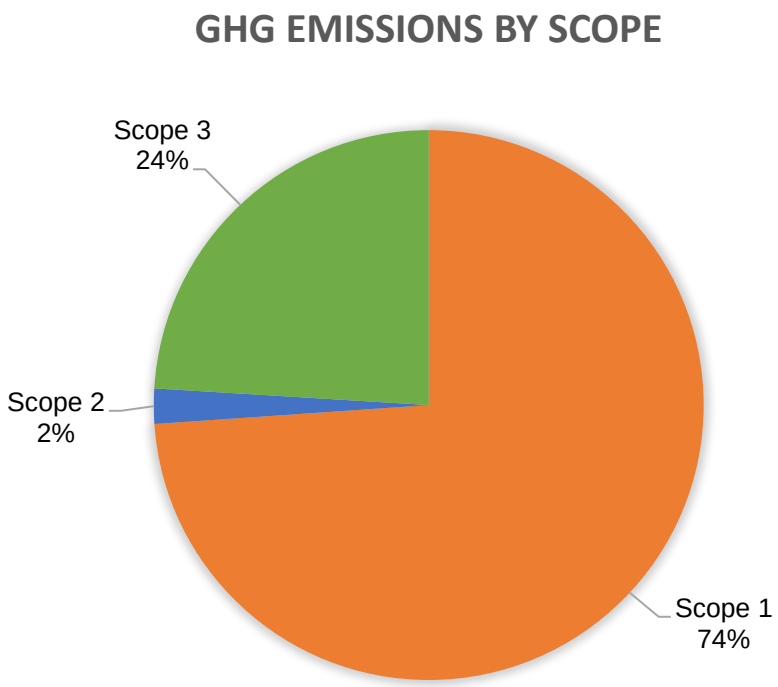



**Figure 3 - Total Emissions by Scope**

Figure 3 shows the breakdown of total emissions (kg $CO_2e$) including CCO by scope. It illustrates that 74% (58,320,981 kg $CO_2e$) are direct emissions (Scope 1), 2% (1,628,356 kg $CO_2e$) are from electricity indirect emissions (Scope 2) and 24% (18,965,868 kg $CO_2e$) are indirect (Scope 3) emissions.

### 3.1.1 Scope 1 Direct Emissions

Scope 1 emissions represent the dominant source of emissions, accounting for 74% of the overall footprint. Most of the emissions come from both open and closed landfills, which account for 44% and 25% of total emissions respectively.

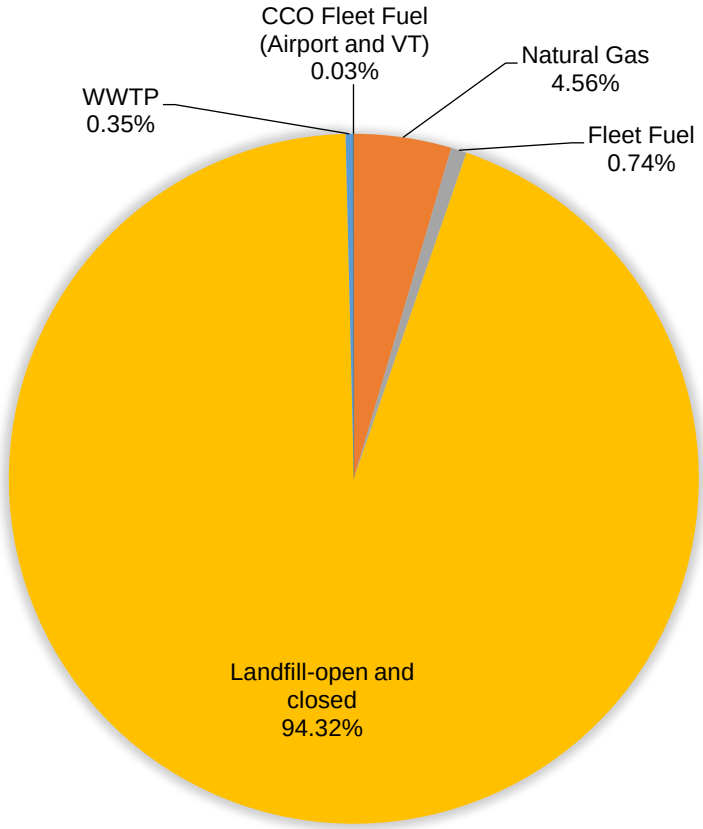
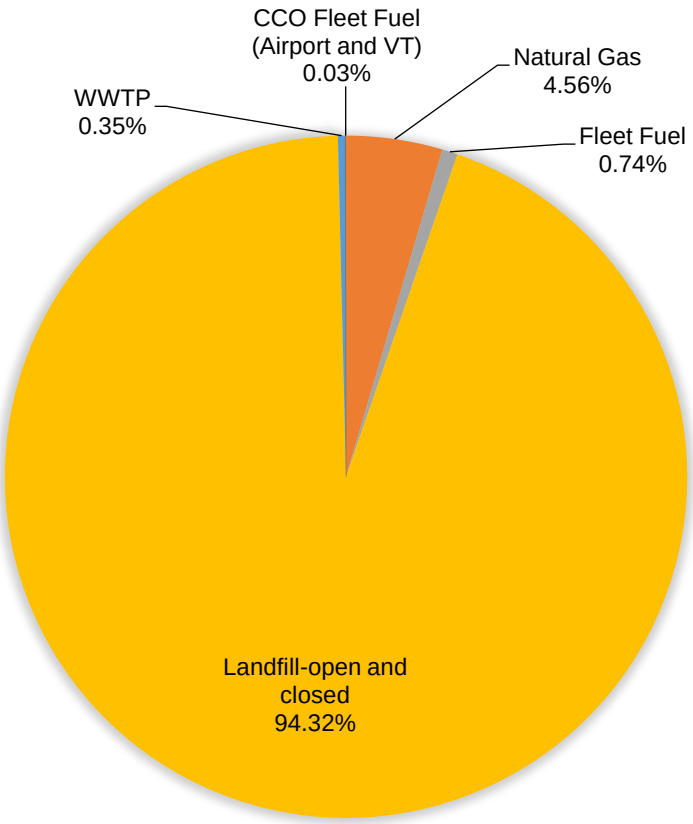



**Figure 4 - Scope 1 Major emissions by Source. (Emission sources less than 0.001% include refrigerants, and CCO fleet fuel and have been omitted from this chart).**

Note that the landfill calculations have been updated in this final report to be in parallel with the emissions from the community carbon footprint. Landfill emissions have only been included that fall within the boundary of NPDC, in similarity with the results from the NPDC community carbon footprint. Landfill emissions that fall within NPDC's operational control have been included below in Table 4. While the first and second largest emissions sources have been discussed above, the third largest source is natural gas (4.56%). This source emits 2,658,520 kg $CO_2e$ per year, which is 3.37% of Scope 1 emissions.

**Table 4: Landfill emissions in AR4 GWPs (kg $CO_2e$)**

| Landfill | Operational control | Proportion in line with calculation undertaken for NPDC's community carbon footprint |
|---|---|---|
| Closed | 26,125,434 | 20,377,838 |
| Operational | 44,399,988 | 34,631,991 |




## SCOPE 1 DIRECT EMISSIONS

### 3.1.2 Closed Landfills

No accurate information on closed landfills is available for the district, therefore all information for closed landfills has been assumed using the national per capita breakdown. NPDC has operational control over a number of landfills including Okato, Inglewood, Okoki Road, Oakura, Waitara, Marfell Park, Waiwhakaiho and Tongaporutu Following closure, these landfill will continue to emit methane from decomposing organic waste and will continue to be a significant source of GHG emissions for NPDC in the future. Guidance from the World Resources Institute indicates fugitive emissions from the landfill will continue to be direct emissions (Scope 1) for as long as NPDC owns the landfill property.

### 3.1.3 Scope 2 Emissions

Scope 2 emissions are entirely generated from use of grid supplied electricity, resulting in 1,628,356 kg $CO_2e$ (including CCO electricity), comprising 2% of NPDC's overall emissions.

### 3.1.4 Scope 3 Emissions

Scope 3 (indirect) emissions totalling 18,965,868 kg $CO_2e$ (20% of total emissions) are generated from several sources (see Figure 5). The largest contributor is the purchase of the goods and services, e.g. consultants, contractors and consumable goods, required by the council. This emission source is 13.42% of total emissions and 56% of Scope 3 emissions. Minor Scope 3 emission sources include NPDC business travel, employee commuting and T&D loss electricity and gas. Like Scope 1 emission sources, Scope 3 emissions are much greater than NPDCs Scope 2 direct emissions. Indirect waste emissions are also included in Scope 3, including food waste emissions. More detailed data for composting operations should be collected in future measurements of corporate emissions.

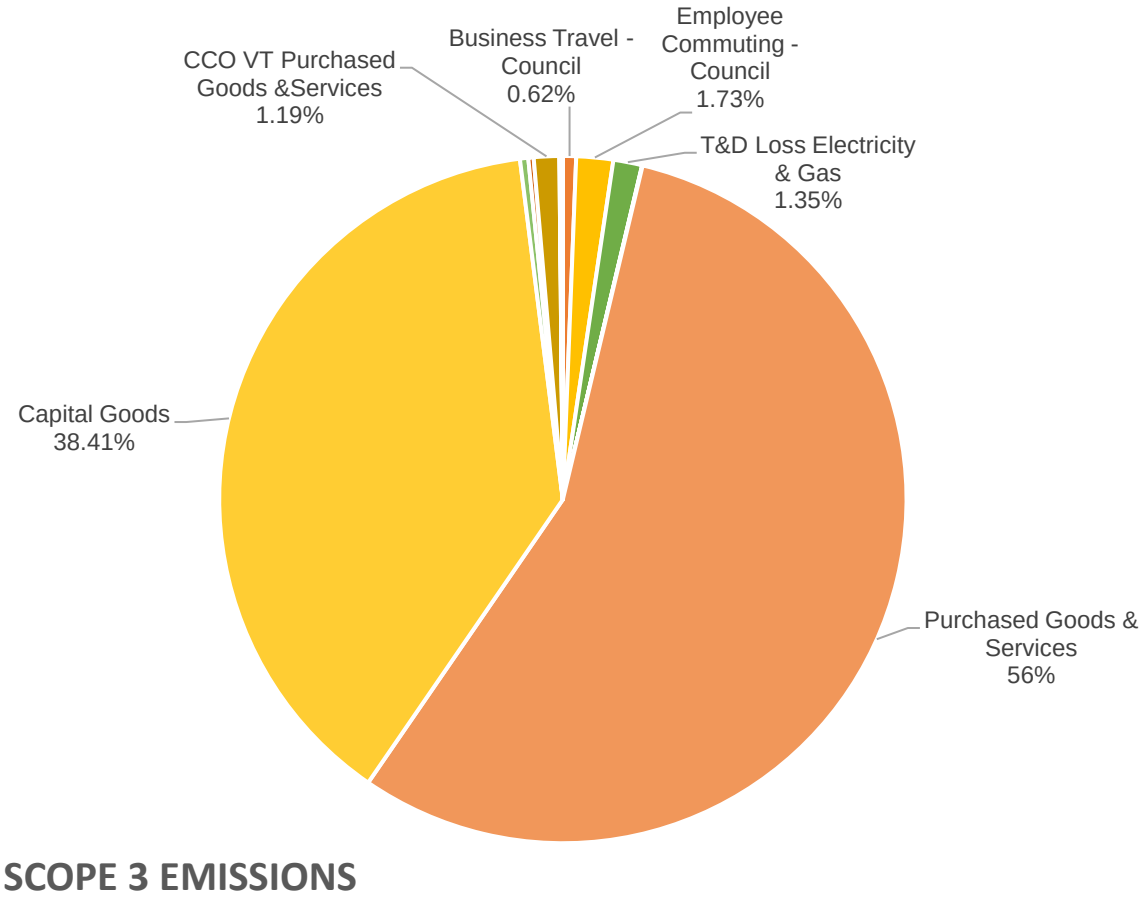



**Figure 5 Scope 3 emissions by source. Emissions source contributing less than 1% are omitted.**

### 3.1.5 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 that year, therefore the stock holdings are reported in Table 5. Emissions from losses of refrigerant are included in the organisation total. Potential liabilities arising from the quantity of refrigerants held in air-conditioning and heating units are reported in this inventory but are not included in the organisation total. Refrigerant holdings were only based on information provided by NPDC and VT. There could be more holdings but these were unbale to be provided at the time of data collection

**Table 5: HFCs, PFCs and SF6 GHG emissions and liabilities.**

| Business Unit | Location | Refrigerant type | Volume (kg) | Potential Liability kg $CO_2e$ |
|---|---|---|---|---|
| NPDC | Civic | R134a | 0.5 | 715 |
| NPDC | Civic | R404a | 0.23 | 902 |
| NPDC | Civic | R404a | 0.4 | 1569 |
| NPDC | Civic | R404a | 1.85 | 7255 |
| NPDC | Civic | R410a | 0.085 | 177 |
| NPDC | TSB Showplace | R600a | 0.18 | 350 |
| NPDC | TSB Showplace | R134a | 0.32 | 458 |
| NPDC | TSB Showplace | R410a | 0.45 | 939 |

| | | | | |
|---|---|---|---|---|
| NPDC | TSB Stadium | R134a | 0.03 | 43 |
| Venture Taranaki | Office | R32 | 2.24 | 715 |
| Venture Taranaki | Office | R410a | 8.96 | 902 |

# 4.0 Emissions Summary (excluding closed landfill)

The following section provides a breakdown of all emissions excluding emissions from the closed NPDC Landfills. This better illustrates the key emissions sources from NPDC's remaining operations. Emissions without the emissions generated by the closed landfill are 58,537,367 kg $CO_2e$.

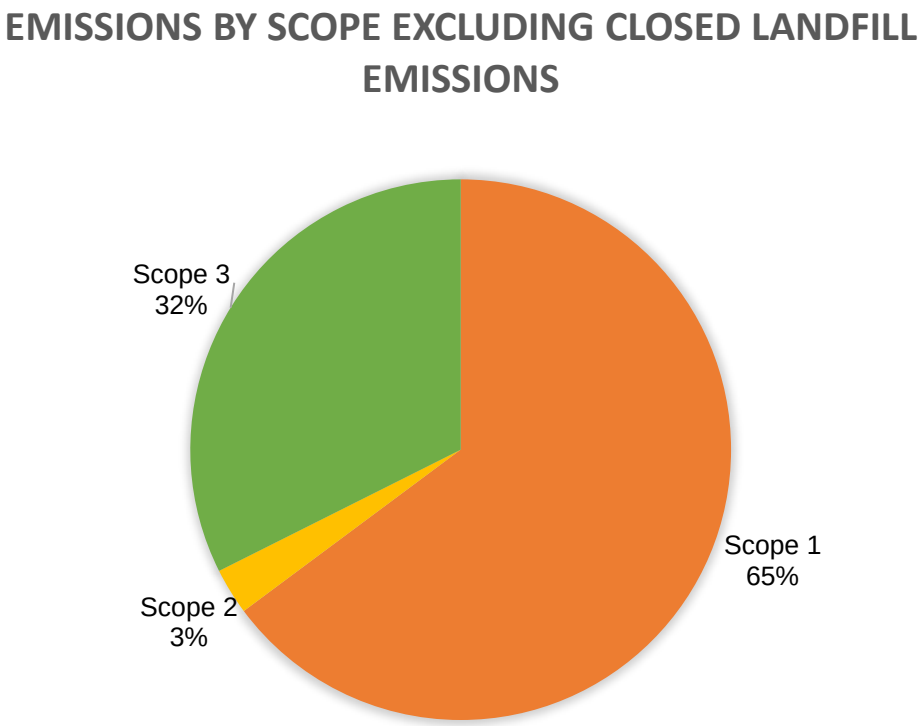



**Figure 6- Corporate Emissions excluding closed landfill by Scope**

Figure 6 illustrates that the majority of NPDC's emissions when the closed landfill emissions are removed remain as Scope 1 emissions, followed by Scope 3 and Scope 1 respectively. These proportions do not change irrespective of the inclusion or exclusion of closed landfill emissions. The Scope 1 emissions (not including closed landfill) are 73,633,842 kg $CO_2e$. Figure 7 below illustrates the Scope 1 emissions by activity. The main contributors to Scope 1 emissions are the operating, open landfill (the Colson Road landfill) and natural gas. Other Scope 1 emission sources include gas use, fleet fuel, wastewater emissions as well as Scope 1 emissions from both CCOs.

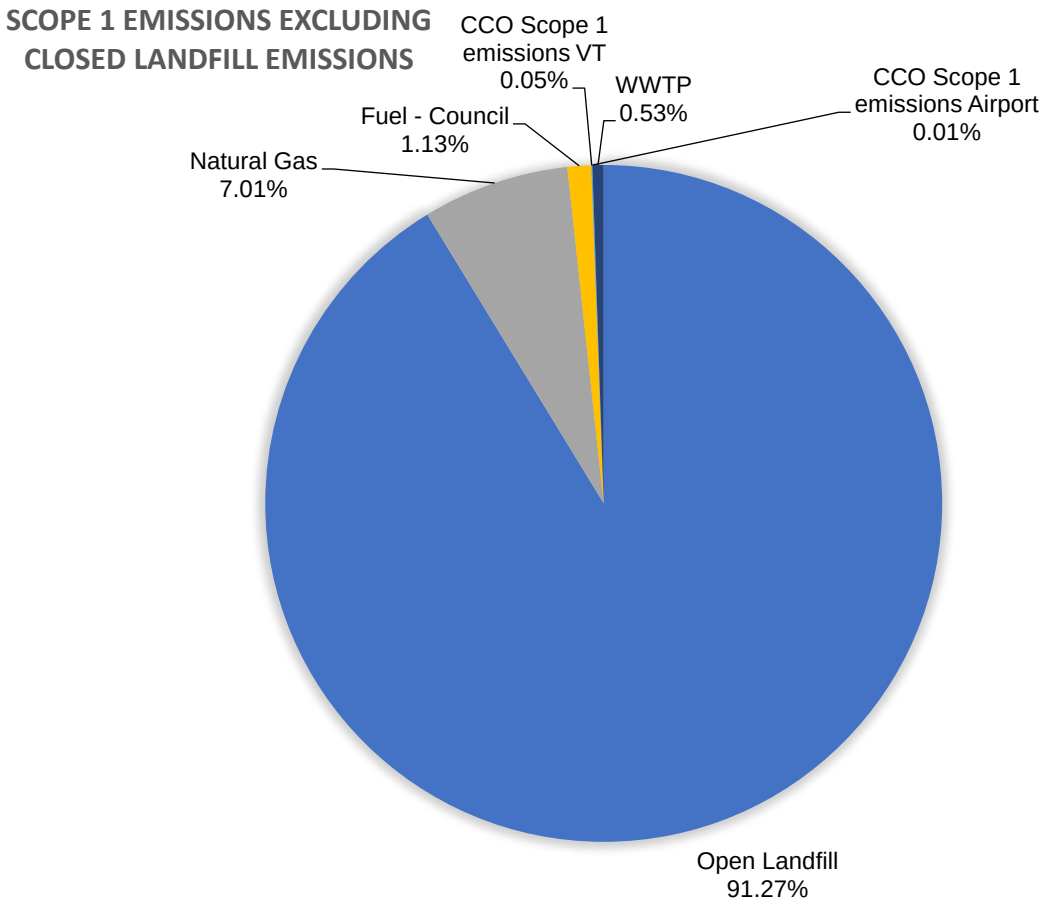



**Figure 7- Scope 1 Emissions by Source excluding closed landfill.**

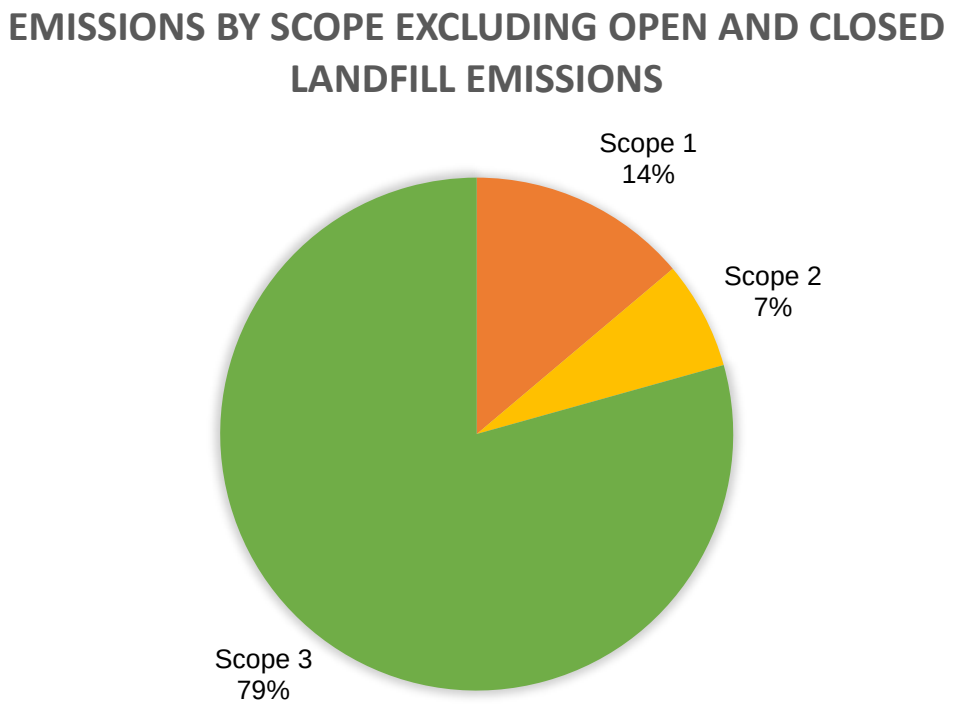



**Figure 8: Corporate emissions excluding both open and closed landfill by Scope.**

Figure 8 illustrates that when both open and closed landfill emissions are removed, Scope 3 is the largest emissions source.

## 4.1 Results by Activities and Groups

The following results illustrate the activity-related emissions for NPDC e.g. 'energy type'-related, or transport-related.

### 4.1.1 Electricity Use

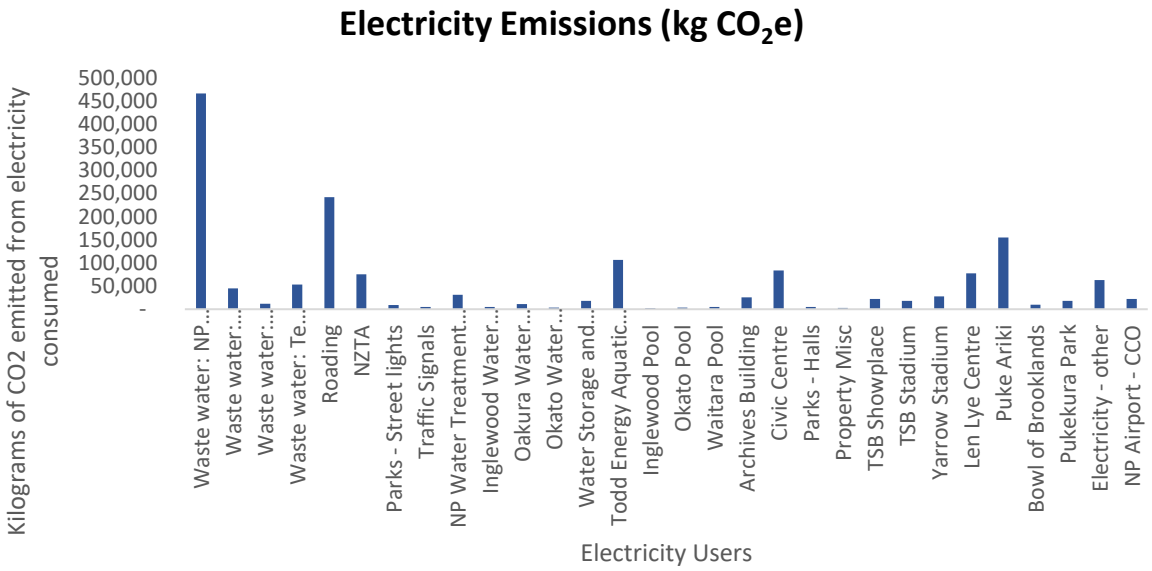



**Figure 9- Electricity Emissions by Source**

Total electricity emissions are calculated to be 1,628,356 kg $CO_2e$ (excluding Transmission & Distribution losses but including CCO electricity sources). The NPDC Wastewater Treatment Plant has the largest electricity use at 29% of total electricity use as per Figure 9.. The second largest source is for roading, at 15% of the total electricity use. This includes electricity used for streetlights and substations.

### 4.1.2 Gas Usage

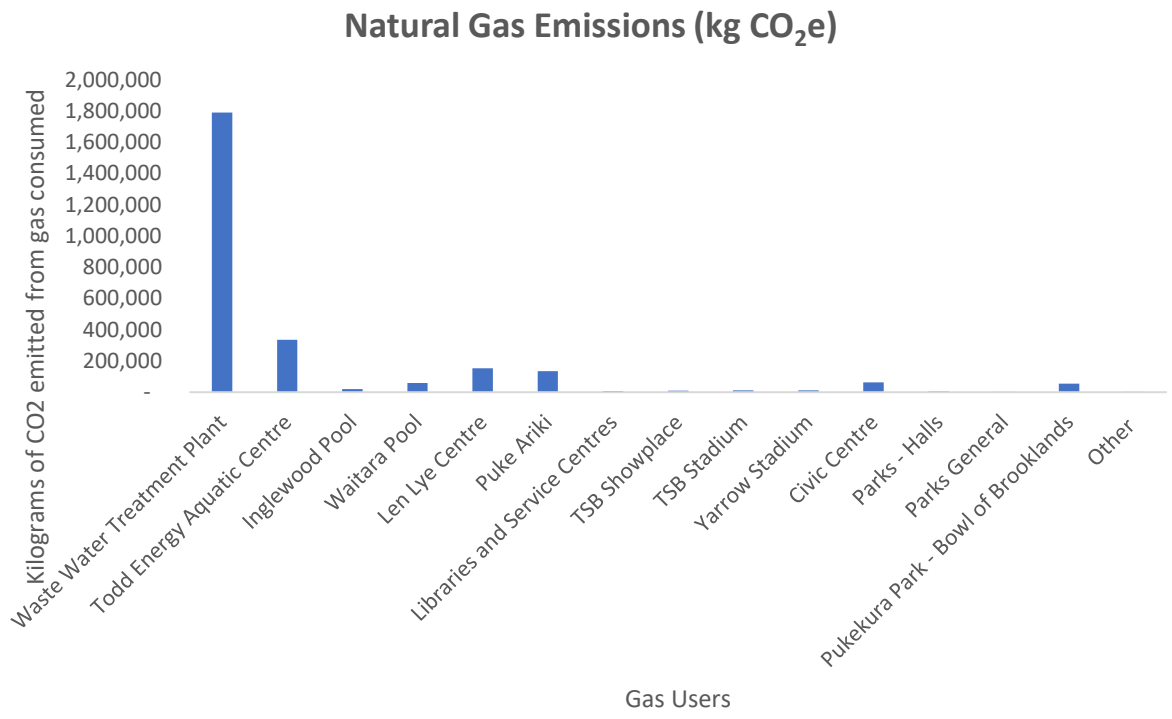



**Figure 10 - Natural Gas Emissions by Source**

Total natural gas emissions are calculated to be 2,658,520 kg $CO_2e$ (excluding Transmission & Distribution losses) with 67% produced by the NPDC Wastewater Treatment Plant site as per Figure 10.

### 4.1.3 Transport Emissions

Figure 11 below shows that fleet fuel (including CCO consumption), employee commuting and air travel are responsible for most transport-related emissions.

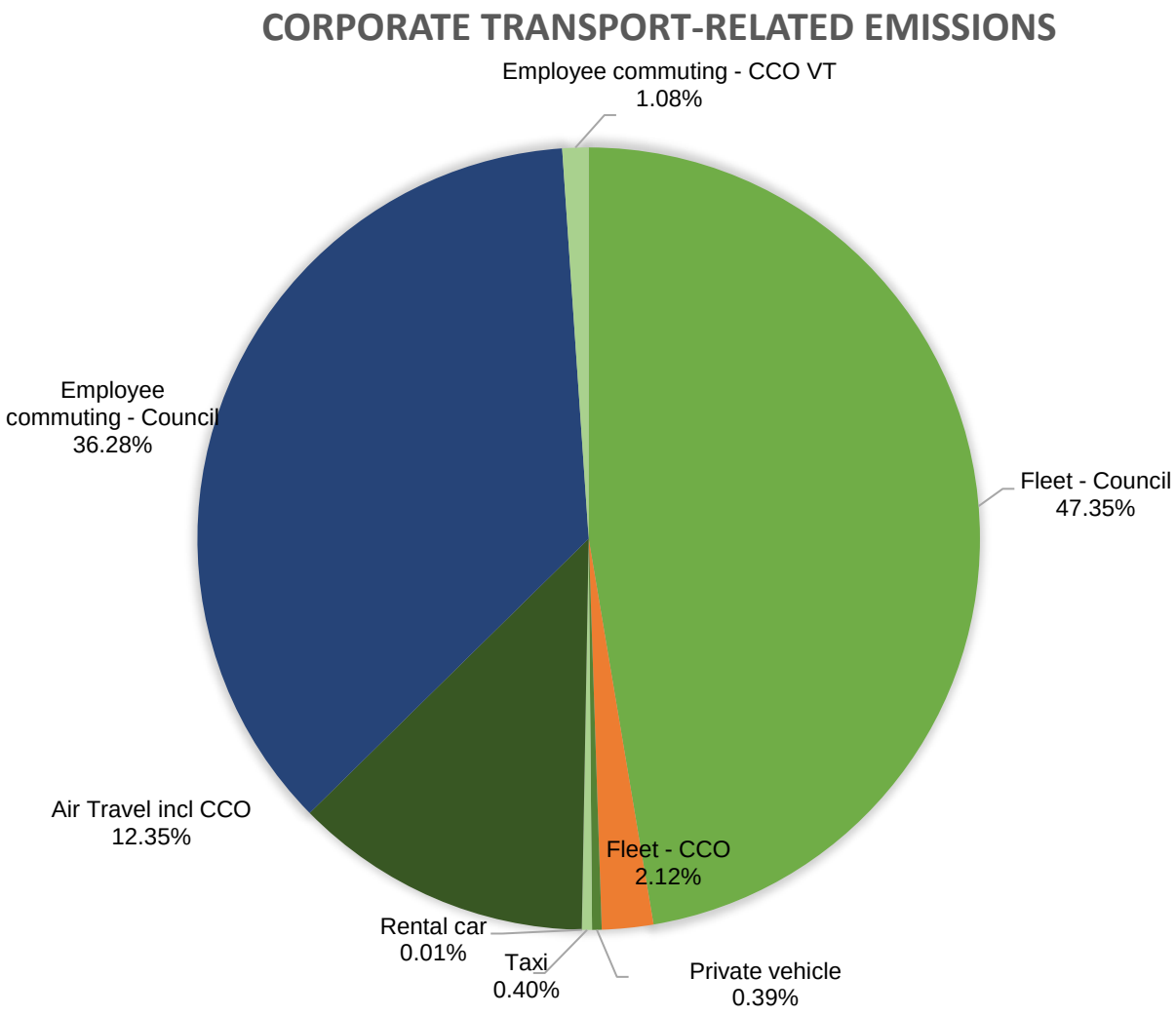



**Figure 11-Transport-related Emissions per Transport Mode**

Transport emissions include fleet vehicle travel, employee commuting, air travel, rental cars and taxis, and mileage business claims for employee travel (private vehicle). Fleet fuel and employee commuting are the major contributors to transport emissions at 47.35% and 36.28% respectively. All fleet vehicles are fuelled by either petrol or diesel. The results of an employee commute travel survey in 2019 and 2017-18 was used as the foundation to estimate emissions. Note that PCard data was provided in an amalgamated dollar form, and it included fuel, flight and accommodation data. There is a risk of double-counting in that some of the PCard data may have additionally been counted within other corporate footprint sources. This is a limitation for this corporate footprint and an area where it would be useful to collect better data in the future.

# Improved Data Quality

We have summarized the various sources of the data in the below table that may need improvement.

| Data Source | Data Quality |
|---|---|
| Refrigerants | E1 |
| Private Mileage (Pcard) | E3 |
| Employee Commuting Data | D1 |
| Business Travel Accommodation | D1 |
| Capital Goods (excluding Office Paper) | D2 |
| Purchased Goods and Services | E1 |
| Upstream Transportation and Distribution – Venture Taranaki | E1 |
| Upstream Transportation and Distribution | E3 |
| Upstream Leased Assets | E1 |

To increase the accuracy of subsequent corporate carbon footprints we recommend that NPDC begins collecting information on air-conditioning and chiller units. This includes collecting data on refrigerant type and charge, in addition to keeping a record of refrigerant top-ups (maintenance). This will ensure that fugitive emissions from these sources can be calculated and included in the boundary in future footprints. We also recommend that more detailed data for composting operations should be collected in future measurements of corporate emissions.

# 5.0 Comparison with other councils in New Zealand

**Figure 12**[12] shows a comparison of GHG emissions in t $CO_2e$ with other councils in New Zealand. NPDC's total GHG emissions (including CCO and landfill emissions) is similar to Rotorua Lakes Council. Note that an FTE figure for Hutt City Council, Wellington City Council, Christchurch City Council and Dunedin City Council was not available in publicly accessible carbon footprint reporting.


**Figure 11: A comparison of Corporate GHG emissions with other councils in New Zealand in $tCO_2e$**

[12] New Plymouth District Council: figure including CCO and landfill
Rotorua Lakes Council: figure including CCO and landfill
Hutt City Council: figure including CCO and landfill
KCDC: operational control approach. Disclosure page on Toitu website didn't mention CCO
WCC: figure including CCO and Joint Venture
Christchurch City Council: excluding CCO
Dunedin City Council: figure excluding CCO
Nelson City Council: figure excluding CCO

# 6.0 References

## 6.1 Carbon footprint calculations

DEFRA (2017) DEFRA (2017) UK Government GHG Conversion Factors for Company Reporting

MfE (2016) - Guidance for Voluntary Greenhouse Gas Reporting – 2016: using data and methods from the 2014 calendar year, Ministry for the Environment, Wellington, New Zealand

MfE (2018) - Ministry for the Environment, New Zealand's Greenhouse Gas Inventory 1990-2016, Ministry for the Environment, Wellington, New Zealand

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.

Pers.Comm, 28/9/2018, Cynthia Cummis, World Resources Institute.

StatsNZ (2018) Population estimates - NZ.Stat table viewer, Statistics New Zealand, Wellington, New Zealand

World Resources Institute and World Business Council for Sustainable Development (2004), The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition, USA.

World Resources Institute and World Business Council for Sustainable Development (2011), Corporate Value Chain (Scope 3) Accounting and Reporting Standard, USA.

# 7.0 Glossary

| | |
|---|---|
| **Carbon Dioxide Equivalent ($CO_2e$)** | A standard unit for measuring carbon emissions. The impact of each different GHG is expressed in terms of the global warming potential (GWP) of one unit of $CO_2$. Standard ratios are used to convert gases into equivalent amounts of $CO_2$; these are based on each gas' GWP. |
| **Carbon Footprint** | A measure of the GHGs emitted by a particular organisation. Typically expressed in terms of $CO_2e$, and for a 12-month reporting period. |
| **Emission Factor** | A metric that converts a specific emission source, such as a litre of diesel, into $CO_2e$. |
| **Global Warming Potential** | A measure of a gas' ability to cause radiative forcing in the atmosphere (or global warming) relative to that of $CO_2$. For example, sulphur hexafluoride has 23,900 times the GWP of $CO_2$, thus is 23,900 times more potent at contributing to global warming than $CO_2$. |
| **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. |
| **Greenhouse Gas Protocol** | Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, 2004 (GHG Protocol); and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard, 2011 has been used in the preparation of this calculation.<br>This protocol provides guidance for organisations preparing a GHG emissions inventory. It defines three scopes (or operational boundaries) for accounting and reporting purposes (explained below). |
| **Scope 1 Emissions** | Direct greenhouse gas emissions that occur from sources owned or controlled by the organisation, such as emissions from the combustion of diesel in the vehicle fleet. |

| | |
|---|---|
| **Scope 2 Emissions** | Emissions associated with the purchase of electricity that is consumed by the organisation. |
| **Scope 3 Emissions** | An optional reporting category that covers all other indirect emissions. These emissions are a consequence of the organisation's activities but occur from sources it does not own or control. Examples include the embodied carbon in materials and air and taxi travel. |
| **ISO standard 14064-1:2018 – Greenhouse Gases** | This standard details principles and requirements for designing, developing, managing and reporting organization-level GHG inventories. It includes requirements for determining GHG emission and removal boundaries, quantifying an organisation's GHG emissions and removals, and identifying specific company actions or activities aimed at improving GHG management. It also includes requirements and guidance on inventory quality management, reporting, internal auditing and the organization's responsibilities in verification activities. |

# 8.0 Limitations

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# Appendix A - Comparison of Corporate Footprint Results with Community Carbon Footprint Results

The following table compares comparable categories of emissions between the community and corporate carbon footprint results. Both sets of results are expressed in AR4 GWP. The Airport's waste emissions from their onsite septic tank have been excluded from the corporate carbon footprint result for this comparison, as they were not included in the community carbon footprint results. For further information as to how the community carbon footprint results were calculated, please refer to the 207-18 New Plymouth District Council Community Carbon Footprint.

**Table 6: Comparison between community carbon footprint and corporate carbon footprint results (kg $CO_2e$).**

| Sector | Community CF results 2017/18 AR4 GWPs | Corporate CF results 2017/18 AR4 GWPs | Corporate as % of Community |
|---|---|---|---|
| Stationary energy | 278,388,977.00 | 4,546,520.67 | 1.6% |
| Transportation | 392,355,450.18 | 905,402.17 | 0.2% |
| Waste | 56,601,740.00 | 55,010,086.58 | 97.2% |

# Appendix B - Data Quality

**Data Quality**

A description of the data quality indicators used in the above sections, with explanations of the terms used in the table, is provided below.

| Data management | Data collection | | |
|---|---|---|---|
| | Measured | Derived | Estimated |
| Robust | M1 | D1 | E1 |
| Satisfactory | M2 | D2 | E2 |
| Questionable | M3 | D3 | E3 |

**Measured** = Data directly provided by a service provider, contractor or directly obtained from a monitoring device. For example, electricity invoices, contractor receipts, emissions monitoring equipment, incident reports, consultant reports etc.

**Derived** = Data obtained from calculations, mass balances, use of physical/chemical properties, use of coefficients and emission factors etc., for example converting cubic meters of waste into tonnes.

**Estimated** = Usually, where there is no other available method for obtaining the data. Such data could be pro-rated on previous results, use precedents or historical data, or even be based on a calculated guess.

**Robust** = Evidence from a sound, mature and correct reporting system, where room for error is negligible. Examples would include well-kept spreadsheets, databases and on-line reporting.

**Satisfactory** = Examples would include manual, but structured keeping of records, files and results. Some potential for error or loss of data.

**Questionable** = No logical or structured approach to data or record keeping. High potential for error &/or loss of data. Data may appear to differ from those initially reported.