A close-up of a blue and purple gradient

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**Greenhouse Gas Emissions Inventory Report** - FY2023/24

Baseline year + 1

Prepared in accordance with ISO 14064-1:2018

Prepared by (lead author): Daygan Eagar, Senior Advisor – Emissions Reporting Lead

Approved by: Rick Lomax, Head of Sustainability

The Head of Sustainability in the Office of the Chief Executive is responsible for this report. Inquiries on the GHG emissions inventory report can be made to: hnzsustainability@tewhatuora.govt.nz.

Dated: 23 October 2024

Verification status: Reasonable for all categories except category 3 CME travel. Limited for category 3 CME travel

Measurement period: 01 July 2023 to 30 June 2024

Base year period: 01 July 2022 to 30 June 2023

*Approved for release by:*

Rick Lomax

Head of Sustainability

Health New Zealand | Te Whatu Ora

Availability

This report will be used to inform the 1 July 2023 – 30 June 2024 Health New Zealand | Te Whatu Ora (Health NZ) Annual Report. Reviewed by the Executive Leadership Team, this report will be available to internal and external stakeholders through Health New Zealand’s website. This report's findings will guide the organisation’s sustainability work programme and inform Health New Zealand’s Emissions Reduction Plan.

Report Content and Structure

The Emissions Inventory Report contains a complete and accurate quantification of the amount of GHG emissions and removals that can be directly attributed to the organisation’s operations within the declared boundary and scope for the specified reporting period. This report has been prepared in accordance with ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals and the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) [[1]](#footnote-2). Where relevant, the inventory reporting aligns with industry or sector best emissions measurement and reporting practices.

The inventory summary contains a high-level summary of this year’s results. Chapter 1 provides information on the organisation, the organisational boundaries and the sources included and excluded in the inventory, followed by information on the emission sources, data collection and more detailed emission results. Chapter 2 briefly describes initiatives in place to reduce organisational emissions.

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Table of Abbreviations/Glossary

|  |  |
| --- | --- |
| CNGP | Carbon Neutral Government Programme |
| CME | Continuing Medical Education |
| DHBs | District Health Boards |
| EECA | Energy Efficiency and Conservation Authority |
| GHG | Greenhouse Gas |
| GJ | Gigajoule |
| GWP | Global Warming Potential |
| kWh | Kilowatt-hour |
| IIG | Infrastructure and Investment Group |
| LFGR | Landfill Gas Recovery |
| MfE | Ministry for the Environment | Manatū Mō Te Taiao |
| NTA | National Travel Assistance |
| 1.5-degree pathway | Setting targets in line with limiting the global average temperature increase to 1.5 degrees Celsius above pre-industrial levels. |
| PPN | Per person night |
| PKM | Passenger-kilometre |
| tCO2e | Tonnes of carbon dioxide equivalent, the common unit of measure for combined greenhouse gases |

Executive Summary

This is the second Emissions Inventory Report for Health New Zealand | Te Whatu Ora (Health NZ) following our baseline inventory. The measurement period covers the second financial year since the organisation’s establishment, from 1 July 2023 to 30 June 2024.

This inventory will inform Health NZ’s sustainability work programme and assist in meeting the directions of the Carbon Neutral Government Programme (CNGP).

Health NZ’s total greenhouse gas (GHG) emissions[[2]](#footnote-3) for the reporting year 1 July 2023 to 30 June 2024 were 205,275 tCO2e.

Table 1 presents Health NZ’s GHG emissions by ISO 14064 Category and GHG Protocol Scope.

Table 1 GHG Emissions by Category

|  |  |  |
| --- | --- | --- |
| ISO 14064-1:2018 Category | GHG Protocol Scopes | tCO2e |
| Category 1: Direct emissions | Scope 1: Direct GHG emissions from sources owned or controlled by Health NZ | 83,087 |
| Category 2: Indirect energy emissions | Scope 2: Energy indirect emissions from purchases of electricity, heating, cooling and steam | 27,015 |
| Category 3: Indirect emissions from transportation | Scope 3: All other indirect emissions that result from the organisation's activities (e.g., upstream and downstream emissions, business travel, waste, supply chain). | 80,696 |
| Category 4: indirect emissions from products or services used by Health NZ | 14,476 |
| Category 5: Indirect emissions associated with the use of products produced by an organisation | - |
| Category 6: Indirect emissions from other sources | - |

Table 2 disaggregates each category emission by main emissions source.

|  |  |  |  |
| --- | --- | --- | --- |
| **Health NZ Emissions Profile by Category** | | **tCO2e** |  |
| **1** | Natural gas | 48,972 |  |
|  | Medical Gases - CO2, N2O, CH4, Acetylene | 13,144 |  |
|  | Fleet Fuels | 8,493 |  |
|  | Coal | 7,718 |  |
|  | Refrigerants | 2,011 |  |
|  | Stationary Diesel | 1,497 |  |
|  | LPG | 712 |  |
|  | Anaesthetic Vapours - Desflurane, Isoflurane, Sevoflurane | 534 |  |
|  | Biomass - CH4, N2O | 7 |  |
|  | **Category 1 Total** |  | **83,087** |
|  |  |  |  |
| **2** | Electricity | 26,418 |  |
| Purchased steam from coal | 586 |  |
| Purchased steam from biomass and landfill gas | 10 |  |
|  | **Category 2 Total** |  | **27,015** |
|  |  |  |  |
| **3** | Staff air travel | 52,415 |  |
| Patient travel by road - Patient travel claims (NTA) | 8,070 |  |
| Patient travel by air - Medical plane | 7,483 |  |
| Patient travel by road - Ambulances | 4,910 |  |
| Patient travel by air - Airline | 4,082 |  |
| Patient travel by air - Helicopter | 3,736 |  |
|  |  |  |
|  | **Category 3 Total** |  | **80,696** |
|  |  |  |  |
|  | Waste to landfill | 6,267 |  |
| **4** | Transmission and distribution (T&D) losses gas and electricity | 3,631 |  |
| Accommodation Patients | 1,553 |  |
| Waste incinerated | 103 |  |
| Water supply | 210 |  |
| Water & Wastewater | 2,712 |  |
|  | **Category 4 Total** |  | **14,476** |
|  | **Total gross emissions (tCO2e)** |  | **205,275** |
|  |  |  |  |
|  |  |  |  |
|  | **Biogenic Emissions (tCO2)** |  | **27,942** |

Table 2 Emissions profile by category source

Figure 1 Emissions by main source (Gas and Electricity inc. T&D losses)

1. Chapter 1: Emissions Inventory Report
   1. Introduction

This is the second Health New Zealand | Te Whatu Ora (Health NZ) annual greenhouse gas emissions inventory report. The emissions inventory is a complete and accurate quantification of the emissions directly attributed to the organisation’s operations within the declared boundary and scope for the reporting period 1 July 2023 – 30 June 2024. Any exclusions from reporting have been documented and justified.

The inventory has been prepared in accordance with the requirements of the following:

* ISO 14064-1:2018 Greenhouse Gases – Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals[[3]](#footnote-4)
* Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004)
* Carbon Neutral Government Programme (CNGP) latest direction and guidance.
  1. Emissions Inventory Results

For FY2023/24, Health New Zealand’s GHG Inventory totalled 205,275 tCO2e. The top 10 emissions by emissions source for the reporting period 1 July 2023- 30 June 2024 are summarised in Table 3 and illustrated in Figure 1.

Table 3 Health New Zealand Top 10 Emissions Sources[[4]](#footnote-5)

|  |  |
| --- | --- |
| Emissions source | tCO2e |
| Staff Air Travel | 52,415 |
| Natural Gas | 50,793 |
| Electricity | 28,235 |
| Patient Travel by Air | 15,301 |
| Medical Gases and Anaesthetic Vapours | 13,671 |
| Patient Travel by Road | 12,980 |
| Fleet Fuels | 8,493 |
| Coal | 8,304 |
| Waste | 6,368 |
| Water & Wastewater | 2,920 |

For the reporting period, direct emissions (Category 1) totalled 83,087 tCO2e and indirect (Category 2,3, and 4) emissions totalled 122,188 tCO2e (Table 4)

Table 4 Direct and Indirect Emissions Sources

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Category** | **tCO2e** | **Subtotal** |
| Direct Emissions | Category 1 | 83,080 | 83,087 |
| Indirect Emissions | Category 2 | 27,015 | 122,188 |
| Category 3 | 80,696 |
| Category 4 | 14,476 |
| Category 5 | - |
| Category 6 | - |

Emissions by Health NZ region is illustrated in Figure 2. The Northern region accounted for the largest share of Health NZ’s GHG emissions at 28% of the total, which aligns to the region with the largest population.

Figure 2 Emissions by region (excludes subsidiaries and corporate office emissions)

Table 5 summarises Health NZ’s GHG emissions by Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O), and various refrigerant categories.

Table 5 Direct GHG emissions quantified per gas

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Direct Emissions per GHG** | | **tCO2e** | **tCO2** | **tCH4** | **tN2O** |
| **GWP of gas** | |  | **1** | **28** | **265** |
| Stationary Combustion | Natural gas | 48,972 | 47,137 | 79 | 2 |
| Coal Sub-bituminous | 4,662 | 4,661 | 0.48 | 0.054 |
| Coal bituminous | 3,055 | 3,055 | 0 | 0 |
| Diesel | 1,497 | 1,489 | 3 | 0.05 |
| LPG | 712 | 676 | 1 | 0.024 |
| Biomass | 6.65 | 6.65 | 0.011 | 0.00023 |
| Transport fuels | Petrol | 6,501 | 6,176 | 10 | 0.22 |
| Diesel | 1,643 | 1,561 | 3 | 0.06 |
| Petrol premium | 349 | 332 | 0.52 | 0.01 |
| Medical gases | Nitrous Oxide | 13,094 |  |  | 49,410 |
| Carbon Dioxide | 46 | 46 |  |  |
| Methane | 0.2 |  | 0.008 |  |
| Acetylene | 0.2 |  |  |  |
| Anaesthetic vapours | Sevoflurane | 450 |  |  |  |
| Desflurane | 75 |  |  |  |
| Isoflurane | 9 |  |  |  |
| Refrigerants | Refrigerant blends: Zeotropes | 936 |  |  |  |
| Hydrofluorocarbons | 592 |  |  |  |
| Substances controlled by the Montreal Protocol | 23 |  |  |  |
| Refrigerants other | 13 |  |  |  |

A detailed breakdown of all emission sources is included in Appendix A.

Appendix B lists the emissions per supplier per group to identify the sources of our most significant emissions.

Appendix C summarises emissions for each CNGP activity.

* 1. Emissions Inventory Results against baseline

Health NZ’s total measured GHG emissions have declined by around 32,500 tCO2e, or 14%, from the 237,822 tCO2e FY2022/23 baseline.

The decrease in emissions is largely driven by significant reductions in emissions associated with Category 1 and 2 stationary energy use (Figure 3). Here, a significant decline in energy from coal of 26,524 tCO2e, or 76%, is the main contributing factor, However, there have also been significant reductions in natural gas use of 4,070 tCO2e (7%) and electricity 2,305 tCO2e (8%).

Much of the progress in reducing emissions associated with stationary energy sources can be attributed to Health NZ’s work on removing coal as an energy source by end FY2024/2025, early work on reducing its dependence on natural gas, and various other energy efficiency programmes

There has also been a decrease in emissions associated with fleet fuels of 722 tCO2e, or 8%. This decrease is largely attributable to progress made as part of Health NZ’s work to transition to Battery Electric Vehicles.

Figure 3 Health NZ Top 10 Emissions Sources FY2023/24 vs Baseline FY2022/23

* 1. Organisational Context
     1. Organisational Description

Health New Zealand | Te Whatu Ora (Health NZ) was established on 1 July 2022 and leads the day-to-day running of the publicly funded health system across Aotearoa New Zealand, with functions delivered at local, district, regional and national levels. It weaves the functions of the former District Health Boards (DHBs) into its regional divisions and district offices (see Figure 4), ensuring continuity of services in the health system. Health NZ is responsible for improving services and outcomes across the health system.



Figure 4 Health NZ Regions

Health NZ is a large organisation with approximately 82,000 FTE (in FY23/24) managing all publicly funded health services, including hospital and specialist services. The organisation has a significant infrastructure portfolio distributed across the motu, consisting of approximately 1,200 clinical and corporate buildings. Emissions are generally concentrated at around fifty hospital campuses.

The organisation has a range of national functional and support services, including the National Public Health Service, Finance, Data and Digital, and Procurement & Supply Chain services, and is supported by eleven subsidiary companies.

Section 7 of the Pae Ora (Healthy Futures) Act 2022 requires that Health NZ address the wider determinants of population health and wellbeing, including effects that adversely impact population health, such as climate change[[5]](#footnote-6). Health NZ recognises that its operations directly impact the environment and that increased environmental sustainability and climate resilience are necessary to continue creating a positive impact on the population's health.

Across Health NZ there are many work programmes driving positive sustainability and climate change outcomes. Within the Office of the Chief Executive, the Sustainabiltiy Function, who are responsible for this inventory have four key workstreams:

* To integrate sustainability into core strategies and culture
* Health system decarbonisation
* Environment in all practices
* Health system resilience and adaptation

This report is a key outcome of the health system decarbonisation work stream, assisting the organisation in complying with requirements under Carbon Neutral Government Programme (CNGP), measuring and monitoring emissions reduction progress, setting emissions reduction targets and developing plans to achieve those targets. Health NZ is continually looking at how to show leadership due to the impact climate change is having and will continue to have on the health of New Zealanders. This leadership is important to contribute toward national emissions reduction targets and to bring others on the journey. To meaningfully reduce our emissions, Health NZ recognises the need to take a whole-of-system approach.

* + 1. Statement of intent

This inventory forms part of Health NZ’s commitment to measure and manage its emissions and report in line with CNGP directions. The report outlines Health NZ’s second year for emissions reporting. Our objective is to use the inventory to track Health NZ’s progress towards its emissions reduction targets, identify opportunities for operational improvements, and provide transparent and credible information to our stakeholders.

* + 1. Reporting period

The emissions reporting period is from 1 July 2023 to 30 June 2024, aligning with CNGP requirements and Health NZ’s financial year.

Health NZ creates emissions inventories annually, and this is the second emissions report for Health NZ; the baseline being FY2022/23. This inventory and future ones will be measured against the FY2022/23 baseline.

* + 1. Organisational boundary and consolidation approach

The highlighted box in Figure 4 shows the organisational boundary for Health NZ within the national health system. This encompasses all previous organisations transferred to Health NZ, including all DHBs, Public Health Units and services transferred to Health NZ from Ministry of Health | Manatū Hauora. Te Aka Whai Ora transitioned to the Hauora Māori Services Directorate within Health New Zealand during the course of FY2023/24. This transition did not require change in data collection or reporting for this inventory as emissions sources that fell within the bounds of Te Aka Whai Ora had already been accounted for in Health New Zealand data due to many shared services and office locations. Figure 5 sets out Health NZ’s organisational boundary during the reporting year.

A diagram of health care

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Figure 5 Health New Zealand organisational boundary FY2023/24

#### Consolidation approach

In this GHG Inventory report, Health NZ has adopted the operational approach for consolidating our emissions data. This method aligns with Health NZ’s primary control and management practices, allowing for a comprehensive and accurate representation of our greenhouse gas emissions. The operational approach is particularly suitable because:

* Health NZ can accurately capture the emissions from facilities, assets, and operations where there is authority to implement operational policies and measures.
* The approach complies with relevant reporting requirements, ensuring that this GHG Inventory meets external standards and expectations. This approach also supports transparency and accountability commitments, as it provides a clear and straightforward framework for reporting emissions from controlled operations.
* By focusing on operations where we have control, the operational approach enables us to identify and prioritise emission reduction opportunities effectively. This focus allows Health NZ to implement targeted initiatives that can significantly impact the overall carbon footprint.

A breakdown of the hospitals, specialist services and office locations are included in Appendix D.

It is difficult to ascertain the boundaries of several hospital sites regarding contracted services and leased spaces within hospital campuses. Therefore, all onsite laundries (whether operated in-house, as a subsidiary or as a contracted service), retail spaces and clinical spaces shared with external organisations are included in the inventory.

* + 1. Business units excluded from inventory

Health NZ works collaboratively with local primary health, wellbeing, and community-based services to improve community health, however, has no operational control over these services; therefore, these are excluded from the inventory.

Table 6 outlines the subsidiary exclusions. Companies of which Health NZ does not hold a majority share have been excluded due to a lack of operational control. The other excluded subsidiaries are insignificant due to their size and operation.

Table 6 Business Unites Excluded from Inventory

|  |  |
| --- | --- |
|  |  |
| Subsidiary | Reason for Exclusion |
| Opotiki Health Centre Ltd | 15% share of ownership and de minimis |
| Tlab Ltd | 50% share of ownership and de minimis |
| Health one Ltd | 50% share of ownership and de minimis |
| Brackenridge Services Ltd | De minimis |
| Spectrum Health Ltd | De minimis |
| South Canterbury Eye Clinic Ltd | De minimis |
| NZ Health Innovation Hub | A virtual subsidiary with no emissions associated with its activity |

* 1. GHG Emissions sources
     1. Significance and Materiality

For a GHG inventory under ISO 14064-1 the determination of significant emission sources for inclusion and exclusion is guided by specific criteria. Criteria that Health NZ uses to determine the significance of emissions sources for inclusion or exclusion include:

* **Materiality:** a materiality threshold has been established, where emissions sources can be excluded if they account for less than 1% of the total inventory. Cumulatively, de minimis exclusions should not exceed 5% of the total inventory.
* **Operational control and influence:**  this refers to Health NZ’s ability to influence or control emissions from a source. Emission sources over which there is direct operational control or significant influence over included. For instance, excluded sources include from subsidiaries where Health NZ does not have a controlling stake (i.e. 51%>).
* **Stakeholder Interest:** consideration is given to the inclusion and retention of emissions sources based on the interest and concerns of our stakeholders. Here energy sources and some waste categories are included because of their importance to stakeholders.
* **Regulatory requirements:** emission sources subject to regulatory reporting, compliance obligations, or specific reduction targets are considered significant. For example, under the CNGP Health NZ is obliged to report on all direct energy source emissions. Consequently, sources like stationary diesel used for backup generators is included even though it is de minimis.
  + 1. Emissions sources included

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

An emissions reporting working group was established in December 2021 to standardise emissions reporting across DHBs. A product of this work was the Te Whatu Ora Emissions Reporting Framework, now the Health New Zealand | Te Whatu Ora Emissions Reporting Framework, which guides and supports the progressive inclusion of emissions sources. This framework is now under review, as there is continued change within publicly funded health system; the value, robustness, timeline and feasibility for wider emissions sources to be formally included in the inventory is being assessed. This review is expected to be complete in FY24/25 and will inform if and how future inventories will be expanded.

Table 7 Emissions sources included in inventory FY2023/24

|  |  |
| --- | --- |
|  |  |
|  | **Emission activities in scope** |
| Category 1 | Coal, natural gas, LPG, diesel stationary, biomass, refrigerants, medical gases (N2O, Entonox, CO2, CH4, Acetylene), Anaesthetic vapours (Desflurane, Isoflurane, Sevoflurane), fleet fuels. |
| Category 2 | Electricity, purchased steam from coal, biomass and landfill gas sources. |
| Category 3 | Staff air travel. Patient air travel by airline, helicopter and medical aeroplanes. Patient travel by ambulance. Patient National Travel Assistance claims (mileage, air travel, public transport, accommodation). Accommodation for patients paid for directly by Health NZ. |
| Category 4 | Waste to landfill, incinerated waste, transmission and distribution losses for natural gas and electricity, distributed energy, water and wastewater. |

* + 1. Emissions sources excluded

Activities that contribute significantly to Health NZ’s total emissions and are not included in this baseline inventory; typically called the ‘Footprint Plus’ these include staff commuting, patient and visitor private travel, purchased goods and services inclusive of commissioned healthcare services, and the embodied emissions arising from capital works and new buildings. As alluded to above, these sources have not been included in this year’s inventory due to data sources and data collection methodologies lack sufficient maturity to provide reasonable assurance of their accuracy. They do nonetheless remain a priority for reduction activities.

Health NZ is also subject to the requirements of the CNGP, which lists several emissions sources that would ordinarily be considered de minimis as mandatory for inclusion. These include:

* Energy sources such as stationary diesel, LPG, biomass and purchased steam from biomass or landfill gas.
* Refrigerants
* Water

In addition to de minimis sources included due to CNGP requirements, all sources related to National Travel Assistance programme (NTA) funded patient transport and accommodation was retained. This includes NTA funded accommodation, taxis, public transport, and flight reimbursements. These sources were retained to ensure complete reporting on emissions relating to funded patient travel and accommodation.

The only emissions sources that were excluded therefore are sources associated with staff accommodation (0.3%) and staff travel related to taxis and rental vehicles (0.2%). Consequently, de minimis emission source exclusions total approximately 0.5% of FY2022/23 baseline.

* + 1. Changes to emissions factors

’Te ine tukunga: He tohutohu pakihi – Measuring Emissions: A Guide for Organisations’ (MEG) is a comprehensive database released by New Zealand's Ministry for the Environment | Manatū Mō Te Taiao (MfE) to aid organisations in calculating and reporting their greenhouse gas (GHG) emissions. This guide aligns with international standards, such as the ISO 14064-1:2018 and the GHG Protocol Corporate Accounting and Reporting Standard, ensuring that the methods used are consistent and transparent.

The guide is periodically updated with revised emissions factors. Reasons for revising emissions factors include:

* The incorporation of the latest scientific research and findings. As scientific understanding of GHG emissions improves, the data used to calculate emission factors is refined to ensure accuracy and relevance. This includes adopting more sophisticated models or techniques that provide a better representation of actual emissions
* Improved data collection methods and the availability of more comprehensive datasets can lead to more accurate emission factors.
* Changes in technology, such as improvements in fuel efficiency or the development of new energy sources, can impact emission factors.
* Electricity emissions factors can change based on annual changes in rainfall and the concurrent change in the proportion of electricity produced through hydro generation, natural gas and coal.

Significant changes to emissions factors provided in the 2024 release of MEG are provided have resulted in a 4.8% decrease in Health NZ’s baseline inventory. The primary drivers in this change are changes to emissions factors for domestic flights, and transmission & distribution (T&D) for electricity and natural gas.

An error associated with the calculation of flights booked through Orbit has also resulted in an understatement of the FY2022/23 baseline of 0.4%.

* + 1. Decision on the restatement of Baseline FY2022/23

Health NZ has a restatement threshold of 7.5%. That is, where changes in the baseline inventory—due to emissions source additions or changes in emission factor calculation methodologies—exceeds 7.5%, the baseline will be restated. Where changes in emissions sources or emissions factors relate to regulatory requirements, are important for emissions reduction planning, or are of particular interest to our stakeholders, this threshold may be lower.

Cumulatively, the exclusion of staff travel (rental cars and taxis) and accommodation as emissions sources (+0.5%), the understatement of Orbit flight emissions (+0.4%), and MEG24 emissions factor changes (+4.8%) has resulted in a total potential change in Health NZ’s baseline inventory of +5.6%.

In the absence of an emission source additions to the inventory for FY2023/24, this change has been determined to be insufficient to warrant a restatement of our baseline inventory.

Where changes in emissions factors have resulted in significant changes in emissions associated with specific sources, such as domestic flights and electricity T&D losses, the impact of these changes will be communicated in reporting.

* 1. Liabilities

HFCs, PFCs and SF6 represent GHGs with high global warming potentials. Other GHG stocks, including coal, stationary diesel, medical gases and biomass, are held on several Health NZ sites. Their accidental release or combustion could result in a large increase in emissions for the reporting period.

Health NZ continues to work on establishing a baseline for all liabilities present at its sites. The Infrastructure Investment Group (IIG) is responsible for all aspects of infrastructure asset management, planning, capital investment, procurement, delivery and ongoing maintenance and facilities management within Health NZ. IIG has developed a National Asset Management Strategy with a proposed work programme to increase the asset management maturity, strategic capability and operational insights, over the next 3 years and beyond, subject to confirmed funding and resourcing. This includes the implementation of a national Asset Management Information System as a critical first step to provide a more comprehensive measurement of refrigerant and stationary fuel liabilities.

It is important to highlight that over the last year work undertaken to transition from coal as an energy source and replace old chiller units with new models that use refrigerants with relatively low GWPs has already had a significant impact on Health NZ’s liabilities.

Table 8 provides stocktake from sites where data was available for liabilities from different holdings. Based on the significance of refrigerants and diesel holdings, further work will be undertaken to gain more detailed insights into holdings per site to assist in implementing procedures to minimise the risk of accidental release.

Table 8 Health NZ GHG Liabilities

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Holdings** | **Quantity** | **Unit** | **Potential liability (tCO2e)** |
| Refrigerants HFCs | 26,690 | Kg | 34,329 |
| Refrigerants blends | 6,380 | Kg | 12,447 |
| Diesel | 1,230,593 | Litres | 3,298 |
| Refrigerants controlled by the Montreal protocol | 4,554 | Kg | 2,426 |
| Medical gases | 6,753 | Kg | 2,107 |
| Refrigerants other | 1,329 | Kg | 1,720 |
| Coal | 142,000 | Tonne | 284 |
| LPG | 36,167 | Kg | 107 |
| Anaesthetic vapours | 900 | Kg | 101 |
| Biomass | 362,000 | Tonne | 5 |
| **Total potential liability tCO2e** | | | **56,825** |

* 1. Land-use change

Land-use change has not been included in this inventory as Health NZ does not own land subject to significant land use change.

* 1. Supplementary results
* Contractual instruments are not applicable for this reporting period.
* No offsets have been purchased for this reporting period.
  1. Data collection and uncertainties

The following approaches were used during data gathering:

* National data collection – involving engagement with companies holding contracts or providing services to several Health NZ sites to provide activity data such as waste to landfill, electricity and fuel consumption.
* Regional and local data collection – involving engagement with key contacts at regional and local sites and companies where national data collection was not possible, to provide activity data such as refrigerant, stationary diesel, liabilities and top-ups.

Emissions are calculated by multiplying emissions activity data with appropriate emissions factors. Most emission factors are sourced from the Te ine tukunga: He tohutohu pakihi – Measuring emissions: A guide for organisations (Ministry for the Environment [MfE], 2024) (MEG). Custom emission factors were created or derived where not available in the MfE MEG and recorded in the Health NZ emission conversions and calculation documentation. Tables 9 to 11 summarise the custom emission factors used in this inventory. Unless otherwise specified, all calculations in this report are expressed in total tonnes of carbon dioxide equivalent (tCO2e).

Table 9 Custom created or derived emissions factors

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Created custom or derived factor name** | **Unit** | **Emission factor kgCO2e/ unit** |
| Biomass (CH4-N2O) - Wood chip Industry - GJ | GJ | 0.023 |
| Biogenic (CO2) - Wood chip Industry - GJ | GJ | 89.47 |
| Coal - Bituminous - Industrial Use - GJ | GJ | 89.1405 |
| Coal - Sub-Bituminous - Industrial Use - GJ | GJ | 92.0005 |
| Biogas - Landfill Gas - GJ | GJ | 0.00000072 |
| HFE-236ea2 (Desflurane) - Bottle | Bottle | 630.31 |
| HCFE-235da2 (Isoflurane) - Bottle | Bottle | 183.634 |
| HFE-347mmz1 (Sevoflurane) - Bottle | Bottle | 82.242 |
| Public Transport - $ | $ | 0.649 |
| Medical waste – Kg | Kg | 0.442 |
| Cytotoxic waste – Kg | Kg | 0.879 |
| Acetylene - kg | Kg | 3.385 |
|  |  |  |

Table 10 Derived emissions factors for aviation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **Created custom or derived factor name** | **Aircraft Reg / type** | **Fuel litres/ hour** | **Jet A1 EF** | **kgCO2e/ hr** |
| Aviation fuels - B350 - hours | B350 | 450 | 2.52 | 1,132 |
| Aviation fuels - B200 - hours | B200 | 380 | 2.52 | 956 |
| Aviation fuels - C90 - hours | C90 | 330 | 2.52 | 830 |
| Aviation fuels – Mustang - hours | Mustang | 400 | 2.52 | 1,006 |
| Aviation fuels - 400XT - hours | 400XT | 600 | 2.52 | 1,510 |
| Aviation fuels – Sovereign - hours | Sovereign | 950 | 2.52 | 2,390 |
| Table 11 Refrigerant GWP |  |  |  |  |

|  |  |
| --- | --- |
|  |  |
| **Refrigerant name** | **GWP** |
| R448a | 1,273 |
| R412A | 2,286 |
| R449A | 1,282 |
| R508 | 13,214 |
| R132A | 338 |
| R170 | 10.2 |
| R1324 | 338 |
| R438A | 2,265 |
| R455A | 146 |
|  |  |

Appendix F lists the data sources, collection methods, uncertainties and assumptions for each emissions source and factor. Health NZ utilises the ‘Accelerate to Zero’ emission reporting tool, developed by Deloitte, for emissions data management, monitoring, reporting and planning.

1.10 Engagement and communication

Health NZ is a member of the Sustainable Business Council[[6]](#footnote-7) and the Global Green and Healthy Hospitals[[7]](#footnote-8) international network, as well as being connected across the motu through engagement with networks such as Sustainable Healthcare Aotearoa[[8]](#footnote-9).

Health NZ’s Sustainability Advisory Panel, made up from internal and external sustainability and healthcare sector members, are regularly updated on progress in relation to emissions reporting and emissions reduction. The Panel provides challenge and enablement of Health NZ’s sustainability work programme; inclusive of the annual Emissions Inventory Report.,

Health NZ has an internal sustainability network of over 350 kaimahi. This network is updated via webinar on a bi-monthly basis of progress against the interim work programme and is regularly invited to share its issues and ideas.

Health NZ is also a member of WasteMINZ[[9]](#footnote-10). As a WasteMINZ member, Health NZ can actively support discussions and initiatives that deliver circular economy outcomes, and waste minimisation benefits, and promote waste education and awareness.

1.11. Continuous improvement

Health NZ is committed to continuously improving its GHG inventory processes. This includes improving data collection processes, reporting practices and stakeholder engagement. Specific actions taken during FY2023/24 include:

* Supplied data improvements: working with suppliers to produce monthly reports from their finance systems instead of needing to rely on invoices for data. For instance, working with Air New Zealand to develop a report in their customer portal system that detail flights taken by staff and patients which have been purchased directly from them.
* Emissions factor revisions: emissions factors and calculations are periodically reviewed to ensure that they are up to date with the latest guidance. Emissions factors were reviewed and changed following the release of MfE’s Measuring Emissions Guidance in June 2024.
* Data accuracy: we are continuously developing processes for ensuring the data we received is checked internally before loading into our emissions reporting tool. For some datasets, specifically those that relate to Category 1 and 2 sources, this happens monthly.
* Quality control: significant data sets received and entered by team members is peer- reviewed. Updates and corrections are made timeously when required.
* Stakeholder engagement: in addition to reporting on and publishing data from main emissions sources in Health NZ’s quarterly reports, inventory data is increasingly being used internally to communicate progress in sustainability actions and to guide planning for future activities.

While good progress has been made in the last year, improvements to our systems and processes for collecting, calculating and then reporting on our GHG emissions is ongoing. Immediate actions in this regard include:

* Updates to the Health New Zealand GHG Emissions Standard Operating Procedure (SOP) will be made to account for emission source changes and data management processes are continually improved. This SOP will continue to detail the approaches to data collection, processing and reporting for each emissions source. The purpose of this SOP is to ensure accuracy, consistency and continuity in Health NZ’s approach to GHG emissions reporting over time.
* Implement a process for routine peer review of data entered into Health New Zealand’s emissions source templates and processing in its GHG Emissions reporting tool.
* Work closely with district stakeholders and their respective line-function structures to develop an approach that ensures the complete, accurate and timely submission of district level data. This data includes, amongst others: refrigerant liabilities and top-ups, stationary diesel liabilities and use, and water consumption.
  1. Monitoring and reporting

Health NZ’s sustainability reporting aligns with CNGP guidance, Aotearoa New Zealand Climate Standards, ISO 14064-1:2018 and the Greenhouse Gas Protocol, and is verified by Toitū Envirocare.

This report covers Health NZ’s second inventory following our baseline year FY2022/23. It is the first to establish how we are progressing toward targets detailed in our Emissions Reduction Plan (ERP).

Health NZ also publishes quarterly Sustainability Reports, which detail in-year trends of key emissions sources like natural gas, electricity, fleet fuels and waste

* 1. Disclosure

The GHG inventory has been third-party verified by Toitū according to ISO 14064-1:2018.

Financial year 01 July 2023 to 30 June 2024

Level of assurance – Reasonable for all categories except category 3 CME travel. Limited for category 3 CME travel

From the analysis conducted, the inventory is classified as: Good

As part of the audit the organisational boundaries, GHG Emissions Inventory Report and application of accounting principles were reviewed and classified as: meets the requirements.

1. Chapter 2: Emissions Management Report
   1. Organisational emissions reduction targets

Te Pae Tata | Interim New Zealand Health Plan 2022-2024 stated the following reduction targets:

* 25% reduction to Category 1 emissions between FY2022/23 and FY24/25
* 25% reduction to Category 2 emissions between FY2022/23 and FY24/25

Te Pae Waenga | New Zealand Health Plan 2024-2027 and the 2024 Statement of Performance Expectations states a combined 25% gross reduction target for Category 1 & 2 emissions between FY2022/23 and FY2024/25.

Health NZ is in the process of finalising its first organisation wide detailed Emissions Reduction Plan (ERP) in line with CNGP direction. This is due to be submitted to Ministry for the Environment | Manatū Mō Te Taiao at end of 2024 and published in 2025. Future iterations of the Emissions Reduction Plan are likely to set emissions reduction targets beyond FY24/25.

* 1. Key performance indicators

To be able to compare emissions across organisations and industries, and to comply with CNGP and ISO standards, Health NZ considers its emissions against funding received and FTE. Patient Bed Days is also used as an intensity metric to enable benchmarking between regions and against other healthcare facilities globally. It is a metric recommended in Global Green and Healthy Hospitals reporting initiatives.

Every 2-3 years Health NZ sets out a Statement of Performance Expectations (SPE) 2024-2027 details a specific gross emissions reduction KPI to track progress against the 25% Category 1 & 2 emissions reduction target.

The baseline year’s emissions per intensity metrics are defined in Table 11.

Table 11 Emissions intensity metrics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | |  |
| Emission intensity metric | Intensity Unit | | tCO2e per unit | |
| Expenditure | $27.9 billion | **7.36** | | tCO2e / $m |
| FTE | 87,000[[10]](#footnote-11) | **2.36** | | tCO2e / FTE |
| Bed Day Equivalent (BDE) | 3.5 million[[11]](#footnote-12) | **58** | | kgCO2e / BDE |

* 1. Initiatives

During the reporting year, Health New Zealand has implemented several emissions reduction initiatives that have contributed significantly emissions reductions against our baseline year. The most impactful initiatives and their contribution to emissions reductions include:

* Substantial progress in removing coal as a source of energy. The removal of coal boilers from 3 Health NZ sites has resulted in direct emissions reductions from coal of 12,700tCO2e or 63% from baseline FY2022/23.
* Additional coal emissions reductions of 13,900 tCO2e, or 96% from baseline, were achieved by partnering with a supplier of steam to switch their boilers to biomass.
* Over the course of FY2023/24 Health NZ has transitioned 325 of its internal combustion engine fleet vehicles to battery electric variants. This has resulted in fleet fuel emissions reductions of 1,290 tCO2e, which represents a decrease of 14% against baseline FY2022/23.

In addition to initiatives that have already delivered emissions reductions, Health NZ continues to implement programmes and initiatives that will continue to drive down our emissions in the next few years. The detail of these initiatives will be included in our first detailed Emissions Reduction Plan, due to be published in 2025.

Appendix A emissions inventory and total Units of Measure (UOM)

|  |  |  |
| --- | --- | --- |
| **Emissions Source** | **Unit of Measure** | **tCO2e** |
| Nat Gas - Industrial - GJ | GJ | 48,972 |
| Electricity - Kwh | Kwh | 26,425 |
| Long-haul (>3700km) - Business class - With Radiative Forcing | Passenger Kms | 16,290 |
| TWO Air travel Default - KgCO2-e | KgCO2-e direct | 13,425 |
| Nitrous oxide | Kg | 13,094 |
| TWO Air travel Default - tCO2-e | tCO2-e direct | 11,735 |
| Petrol - Default\* - Petrol - Default\* - litre | Litre | 6,501 |
| Passenger Vehicle - Petrol Vehicle - Default - Km (NTA) | Km | 5,391 |
| Long-haul (>3700km) - Economy class - With Radiative Forcing | Passenger Kms | 5,135 |
| Aviation fuel (Kerosene) - litre (Cat 3) | Litres | 5,106 |
| Coal - Sub-Bituminous - Industrial Use - GJ | GJ | 4,662 |
| Waste with gas recovery (unknown composition) - General Waste - Kg | Kg | 4,068 |
| Passenger Vehicle - Diesel Vehicle - 2000–<3000 cc - Post 2015 - Km | Km | 3,883 |
| Helicopter Eurocopter AS350B3 Squirrel - Hrs | Hours | 3,736 |
| Coal - Bituminous - Industrial - GJ | GJ | 3,055 |
| Ave. Wastewater Treatment Plants | M3 | 2,712 |
| Long-haul (>3700km) - Premium economy class - With Radiative Forcing | Passenger Kms | 2,603 |
| TWO Public Transport $ (NTA) | $ | 2,412 |
| TWO Clinical / medical / sharps waste autoclaving and landfilling - Kg | Kg | 2,196 |
| Domestic - Large aircraft - With Radiative Forcing | Passenger Kms | 2,150 |
| Domestic - Medium aircraft - With Radiative Forcing | Passenger Kms | 2,039 |
| Natural Gas T&D - GJ | GJ | 1,821 |
| Electricity T&D - kWh | Kwh | 1,810 |
| Diesel - Diesel - litre | Litre | 1,643 |
| TWO Aviation fuel (Kerosene) - Aviation fuel (Kerosene) - B200 - hours | Hours | 1,526 |
| Diesel - Commercial use - litre | Litre | 1,497 |
| New Zealand - MfE (Cat 4) | Room Per Night | 1,355 |
| Short-haul (<3700km) - Economy class - With Radiative Forcing | Passenger Kms | 1,114 |
| Vehicle KgCO2e direct | KgCO2-e direct | 1,014 |
| HFC-134a (R-134a) - Kg | Kg | 949 |
| Domestic - National average - With Radiative Forcing | Passenger Kms | 798 |
| LPG - Commercial use - kg | Kg | 712 |
| 410A - Kg | Kg | 630 |
| TWO Purchased Steam from coal - GJ | GJ | 586 |
| Domestic - National average - With Radiative Forcing (NTA) | Passenger Kms | 585 |
| TWO HFE-347mmz1 (Sevoflurane) - Bottle | Bottle | 450 |
| TWO Aviation fuel (Kerosene) - Aviation fuel (Kerosene) - B350 - hours | Hours | 425 |
| Premium Petrol - Premium Petrol - litre | Litre | 349 |
| TWO Aviation fuel (Kerosene) - Aviation fuel (Kerosene) - C90 - hours | Hours | 338 |
| Taxi travel - regular - dollars spent ($3.20/kilometre) - $ (NTA) | $ | 267 |
| TWO Aviation fuel (Kerosene) - Aviation fuel (Kerosene) - Mustang - hours | Hours | 236 |
| Water Supply Emission Factors (Unit m3) - m3 | m3 | 210 |
| New Zealand - MfE | Room Per Night | 192 |
| Domestic - Small aircraft - With Radiative Forcing | Passenger Kms | 182 |
| 407C - Kg | Kg | 181 |
| 404A - Kg | Kg | 165 |
| Short-haul (<3700km) - Business class - With Radiative Forcing | Passenger Kms | 162 |
| TWO Cytotoxic waste incineration - Kg | Kg | 103 |
| TWO Aviation fuel (Kerosene) - Aviation fuel (Kerosene) - 400XT - hours | Hours | 85 |
| TWO HFE-236ea2 (Desflurane) - Bottles | Bottle | 75 |
| HCFC-22 (R-22) - Kg | Kg | 67 |
| Carbon dioxide | Kg | 43 |
| Long-haul (>3700km) - First class - With Radiative Forcing | Passenger Kms | 29 |
| HFC-32 (R-32) - Kg | Kg | 19 |
| Short-haul (<3700km) - Average passenger - With Radiative Forcing | Passenger Kms | 14 |
| Passenger Vehicle - Diesel Vehicle - 2000–<3000 cc - 2010 to 2015 - Km | Km | 12 |
| TWO HCFE-235da2 (Isoflurane) - Bottle | Bottle | 9 |
| HFE-449sl (HFE-7100)   - Kg | Kg | 7 |
| TWO Biomass (CH4-N2O) - GJ | GJ | 7 |
| Australia - MfE | Room Per Night | 6 |
| Long-haul (>3700km) - Average passenger - With Radiative Forcing | Passenger Kms | 4 |
| TWO Purchased Steam from biomass - GJ | GJ | 3 |
| Singapore - MfE | Room Per Night | 2 |
| Waste without gas recovery (unknown composition) - General Waste - Kg | Kg | 0.43 |
| TWO Custom Acetylene - Kg | Kg | 0.26 |
| Methane - Kg | Kg | 0.23 |
| United Kingdom - MfE | Room Per Night | 0.13 |
| United States - MfE | Room Per Night | 0.12 |
| Netherlands - MfE | Room Per Night | 0.027 |
| TWO Biogas - Landfill Gas - GJ (CAT2) | GJ | 0.003 |
| Steel, structural, columns and beams - Kg | Kg | 0 |
| Average - MfE | Room Per Night | 0 |
| TWO Recycling - placeholder | Kg | 0 |
| TWO Oxygen | Kg | 0 |
| **Grand Total** |  | **205,275** |

Appendix B Emissions per supplier

|  |  |  |
| --- | --- | --- |
| Emissions source | Supplier | Total tCO2e |
| **Fuel** | Allied Petroleum | 31 |
| Birchfield | 5,658 |
| BOC | 20 |
| BP Fuel Cards | 8,283 |
| Canterbury District Energy Inputs | 2,065 |
| District Inputs | 2,171 |
| Genesis | 49,980 |
| Kiwi Fuel Cards | 3 |
| Mobil | 123 |
| NZ Fuel Cards | 41 |
| Other Supplier | 821 |
| Subsidiary Inputs | 22 |
| **Medical Gases, Refrigerant & Other** | Air Liquide | 2,591 |
| Baxter | 534 |
| BOC | 10,546 |
| **Purchased Energy** | Canterbury District Energy Inputs | -170 |
| Contact (Simply Energy) | 23,456 |
| Genesis | 2,943 |
| Pioneer Energy | 589 |
| Smart Power | 71 |
| Meridian | 1,462 |
| Subsidiary Inputs | 601 |
| **Travel Vehicle** | Free Wellington Ambulance | 1,014 |
| National Travel Assistance Programme (NTA) | 8,070 |
| Pro Med | 12 |
| St John Ambulance Service | 3,883 |
| **Travel Air** | Air Gisborne | 523 |
| Air Napier | 39 |
| Air Wanganui | 1,064 |
| AirNZ (Direct) | 11,735 |
| District inputs | 22,301 |
| FcM | 5,003 |
| HNZ National Ambulance Services Office (NASO) | 3,736 |
| LifeFlight | 1,480 |
| Mainland Air | 54 |
| National Travel Assistance Programme (NTA) | 585 |
| Orbit (House of Travel) | 13,428 |
| Philips Search and Rescue | 232 |
| Skyline Aviation | 2,609 |
| Stewart Island Flights | 2 |
| Sunair | 140 |
| Tandem | 2,997 |
| You Travel | 218 |
| GCH Aviation | 1,572 |
| **Materials & Waste** | District Inputs | 266 |
| Envirowaste | 1,458 |
| Interwaste | 1,433 |
| Northland Regional Landfill | 86 |
| Northland Waste | 29 |
| Waste Management | 3,068 |
| Subsidiary Inputs | 22 |
| Corporate Office Inputs | 4 |

Appendix C Overview per CNGP activity group

|  |  |
| --- | --- |
| **CNGP Activity Groups** | **tC02e** |
| Scope 1 - Agriculture (all emissions) | - |
| Scope 1 - Biofuel (fossil fuel emissions and N2O and CH4 component for the biofuel portion) | - |
| Scope 1 - Biomass (fossil fuel emissions and N2O and CH4 component for the biofuel portion) | 10 |
| Scope 1 - Forestry - harvest/deforestation | - |
| Scope 1 - Refrigerants, medical and other gases | 15,682 |
| Scope 1 - Other | - |
| Scope 1 - Stationary combustion - coal | 7,718 |
| Scope 1 - Stationary combustion - natural gas and LPG | 49,684 |
| Scope 1 - Stationary combustion - other (e.g. diesel) | 1,497 |
| Scope 1 - Transport fuels - aviation | - |
| Scope 1 - Transport fuels - other (e.g. shipping fuel) | - |
| Scope 1 - Transport fuels - vehicle fleet | 8,493 |
| Scope 2 - Electricity | 26,425 |
| Scope 2 - Other (e.g. purchased steam) | 586 |
| Scope 3 (mandatory) - Air travel domestic | 30,329 |
| Scope 3 (mandatory) - Air travel international | 25,350 |
| Scope 3 (mandatory) - Business travel other (e.g. taxi, hotel, rental cars) | 2,570 |
| Scope 3 (mandatory) - Freight | - |
| Scope 3 (mandatory) - Staff working from home | - |
| Scope 3 (mandatory) - Transmission and distributions losses (electricity) | 1,810 |
| Scope 3 (mandatory) - Transmission and distributions losses (natural gas) | 1,821 |
| Scope 3 (mandatory) - Waste (to landfill) | 6,368 |
| Scope 3 (mandatory) - Wastewater | 2,712 |
| Scope 3 (mandatory) - Water | 210 |
| Scope 3 (other material) - Emissions from purchased goods and services | 15,347 |
| Scope 3 (other material) - Emissions from purchased capital goods | - |
| Scope 3 (other material) - Other (e.g. staff commuting, investments, leased assets) | 8,655 |
| Scope 1 Biogenic emissions - Biofuel CO2 component (considered carbon neutral) | - |
| Scope 1 Biogenic emissions - Biomass CO2 component (considered carbon neutral) | 27,942 |
| Removals - Forest growth removals | - |

Appendix D Overview of location/sites

|  |  |  |
| --- | --- | --- |
| Included locations in the emissions inventory | | |
| National | Northern Regional Alliance Ltd | Auckland, Penrose, Level 2, 650 Great South Road |
| Central Region’s Technical Advisory Services Limited (TAS) | Auckland, Takapuna, Level 3, Barrys Point Road |
| Wellington, 69 Tory Street |
| HealthShare | Hamilton, 16 Clarence Street |
| New Zealand Health Partnerships (NZHP) | Auckland Ellerslie, Level 1, Building 7, Central Park, 666 Great South Road |
| Health Alliance & Health Source | Auckland, Penrose, 581-585 Great South Road |
| South Island Alliance | Business Unit within Canterbury district |
| Te Hiringa Hauora/ Health Promotion Agency | Auckland, Ellerslie, Level 2, Ascot Central, 7 Racecourse Drive |
| Wellington, The Terrace, Level 14/15/16 101 |
| Christchurch, BNZ Building Hereford Street |
| National offices | Whanganui, Level 2, 179 Hill Street |
| Wellington, Level 5-6, 42-52 Willis Street (Spark Central) |
| Wellington, Levels 4-7, 83 Molesworth Street (Shamrock House) |
| Wellington, 133 Molesworth Street (Manatū Hauora) |
| Christchurch, Level 2, 48 Hereford Street |
| Dunedin, Level 9, 481 Moray Place |
| Auckland Manukau, Level 4, Kotuku House, 4 Osterley Way |
| Northern region | Te Tai Tokerau | Bay of Islands Hospital |
| Dargaville Hospital |
| Kaitaia Hospital |
| Whangarei Hospital |
| Various community locations |
| Waitematā | Mason Clinic |
| North Shore Hospital |
| Waitakere Hospital |
| Various community locations |
| Te Toka Tumai | Auckland City Hospital |
| Greenlane Clinical Centre |
| Auckland Spinal Rehabilitation |
| Various community locations |
| Counties Manukau | Middlemore Hospital |
| Manukau Surgery Centre |
| Pukekohe |
| Various community locations |
| Te Manawa Taki region | Waikato | Matariki Hospital |
| Rhoda Read Hospital |
| Thames Hospital |
| Tokoroa Hospital |
| Waikato Hospital |
| Various community locations |
| Lakes | Rotorua Hospital |
| Taupo Hospital |
| Various community locations |
| Hauora a Toi Bay of Plenty | Tauranga Hospital |
| Whakatane Hospital |
| Various community locations |
| Tairāwhiti | Gisborne Hospital |
| Various community locations |
| Taranaki | Hawera Hospital |
| Taranaki Base Hospital |
| Various community locations |
| Central Region | Te Pae Hauora o Ruahine o Tararua MidCentral | Horowhenua Hospital |
| Palmerston North Hospital |
| Various community locations |
| Whanganui | Whanganui Hospital |
| Various community locations |
| Capital Coast | Kenepuru Hospital |
| Wellington Hospital |
| Various community locations |
| Hutt Valley | Hutt Valley Hospital |
| Various community locations |
| Te Matau a Māui Hawke's Bay | Hawkes Bay Hospital |
| Various community locations |
| Wairarapa | Wairarapa Hospital |
| Various community locations |
| Te Waipounamu region | Waitaha Canterbury | Ashburton Hospital |
| Burwood Hospital |
| Christchurch Hospital |
| Hillmorton Hospital |
| Kaikoura Integrated Family Health Centre |
| Princess Margaret Hospital |
| Various community locations |
| Te Tai o Poutini West Coast | Grey Base Hospital |
| Various community locations |
| Nelson Marlborough | Mental Health Admissions Unit - Nelson |
| Nelson Hospital |
| Wairau Hospital |
| Various community locations |
| South Canterbury | Timaru Hospital |
| Various community locations |
| Southern | Dunedin Hospital |
| Lakes District Hospital |
| Southland Hospital |
| Wakari Hospital |
| Various community locations |
| Subsidiaries | Allied Laundry Services Ltd | Allied Laundry Services Ltd |
| Tairāwhiti Laundry Services Ltd | Tairāwhiti Laundry Services Ltd |
| Enable New Zealand Ltd | Enable New Zealand Ltd |
| Canterbury Linen Services Ltd | Canterbury Linen Services Ltd |

Appendix E Emissions sources, data collection and uncertainty per category

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Category 1** | | | | | | |
| **Source** | **Data source** | **UOM** | **Emission factor** | | **Boundary or dataset comments** | **Uncertainty** |
| Coal | Canterbury district Inputs | GJ | Custom Coal -Sub-bituminous - Industrial- GJ | | Steam generated at Christchurch Hospital is delivered and sold to Otago University School of Medicine (SoM). As CNGP participant consumption by the university is deducted from Christchurch hospital consumption. Other site Ashburton Hospital | High quality - Based on delivered coal on invoice in tonnes and caloric value testing to calculate consumption in GJ |
| Birchfield | Custom Coal -Bituminous - Industrial- GJ Custom Coal -Sub-bituminous - Industrial- GJ | | Nelson Marlborough and Westcoast sites | High quality - Based on delivered coal on invoice in tonnes and caloric value testing to calculate consumption in GJ |
| Biomass CH4 &N2O | Southern district inputs | GJ | Custom Biomass CH4 - N2O Category (Cat) 1 - GJ | | Wakari Hospital (Lumber) | High quality - It is assumed the supplier reports are complete and accurate |
| Canterbury district Inputs | Christchurch Hospital changed over from coal to biomass in February 2023. | High quality - Based on delivered energy in GJ from invoices |
| Natural gas | Genesis | GJ | Natural Gas - Industrial use - GJ | | Includes all ICPs under contract of Health NZ. Includes ICPs of leased buildings, included as Cat 1 emissions under operational control. Subsidiary Allied Laundry has dedicated natural gas ICP, but ICP is billed under Mid-Central # ICP 0001426078QT-A51. Tairawhiti Laundry is a 100% subsidiary. Energy use is included under Tairawhiti sites.Waikato Hospital supplies steam to the onsite hospital laundry operated by Taylors for the hospital. Consumption included under Waikato Hospital. 25 time of use (TOU) ICPS around 95% consumption, 53 non-half hourly (NHH) ICPs 5% consumption | High quality - Meter readings. It is assumed the supplier reports are complete and accurate. |
| Diesel stationary | District inputs, various suppliers | L | Diesel - Commercial Use - litre | | Some sites have not submitted data or have not needed to top-up tanks. | High quality - It is assumed the local staff inputs are complete and accurate and based on invoiced deliveries |
| LPG | District inputs, various suppliers | kg | Stationary fuels - LPG Commercial use - Kg | | Christchurch has reticulated LPG measured in GJ, converted to kg | High quality - It is assumed the district staff inputs are complete and accurate |
| Medical gases | BOC Gas New Zealand (BOC) | kg | CO2 - kg N2O - kg Custom Acetylene - kg LPG - kg CH4 - kg | | Datasets supplied by BOC record kgs and only include the GHG emissions of the relevant medical gas where these are mixtures. This means the kg data for Entonox is the KGs of N2O of that bottle size, not the full KG content of the Entonox bottle. Column N displays Entonox and Nitrous Oxide as contained GHG, but both are the KGs of N2O, not Entonox's KG. BOC also supplies some LPG. | High quality - It is assumed the supplier reports and conversions based on bottles sold are complete and accurate |
| Air Liquide | CO2 - kg N2O - kg Entonox - kg | | Data in the tool converted from bottles to kg GHG per bottle | High quality - It is assumed the supplier reports and conversions based on bottles sold are complete and accurate |
| Anaesthetic vapours | Baxter | kg | Custom HFE-347mmz1 (Sevoflurane) - Bottle; Custom HFE-236ea2 (Desflurane) - Bottle; Custom HCFE-235da2 (Isoflurane) - Bottle | | Custom emission factors were created to record emissions per bottle sold | High quality - It is assumed the supplier reports based on bottles sold are complete and accurate |
| Fleet fuels | BP fuel cards | L | Diesel - Diesel - litre; Regular Petrol - litre; Premium Petrol - litre; | | All regions | High quality - It is assumed the supplier reports based on fuel card transactions are complete and accurate |
| Mobil Fuel cards | Te Tai Tokerau and Nelson Marlborough sites only |
| Allied petroleum | Bay of Plenty and West Coast sites only |
| LeasePlan (Mobil) | Midcentral sites only |
| NZ fuel cards | Bay of Plenty sites only |
| Kiwi fuel cards | Corporate |
| Refrigerants | District Inputs, various suppliers | kg | Various refrigerants AR5 | | Includes refrigerants of hospital sites. Leased offices or smaller community buildings are excluded. | Medium to low quality. Not all sites report on refrigerant top-ups, had no data available or had to make assumptions. Recorded data likely underestimates real leakage. |
| **Category 2** | | | | | | |
| **Source** | **Data source** | **UOM** | **Emission factor** | | **Boundary or dataset comments** | **Uncertainty** |
| Electricity AoG TOU and NHH contract | Simply Energy | kWh | Electricity - kWh | | Includes all ICPs under contract of Health NZ. Includes ICPs on our account of leased buildings and are included as Cat 2 emissions under operational control. Consumption is booked in the previous month of invoice month. ICP 0007195596RN638 belongs to Subsidiary Canterbury Linen. Christchurch Hospital invoices electricity on to the University of Otago, booked as cat 4. About 139 TOU ICPs with consumption of around 90%-95% of electricity. | High quality - Meter readings. It is assumed the supplier reports are complete and accurate. |
| Genesis | Per May FY2023/24 Counties Manukau changed TOU meters from Simply to Genesis. |
| Meridian | Reconciliation of Meridian ICPs at Health NZ sites. List is now complete. Meridian has produced an annual report for TOU and NHH meters for FY2023/24. |
| Electricity other contracts | Mercury | NZ Health Partnerships (NZHP) leased office building. No charges for level 1 for Sep and October, as no ICP was in place. Level 1 ICP consumption is for the full floor; NZHP occupies half. Full consumption was reported, but insignificant impact. |
| Smart Power | Direct readings from smart meters, so electricity use directly apportioned to Health NZ activity at leased sites. |
| Corporate or shared services direct inputs |  |
| Purchased Landfill gas | Nelson City Council | GJ | Custom Biogas - Landfill Gas - GJ | | Nelson Hospital. Health NZ owns the landfill gas boiler house and operates the boiler, but Nelson Council owns the boiler assets. Included as Cat 2. | Medium quality - based on tonnes of steam recorded and conversion to GJ |
| Purchased heat and steam | Pioneer Energy | GJ | Custom Coal -Sub-bituminous - Industrial- GJ | | Dunedin and Southland sites. Steam on sold to Health NZ Southern moved from coal to biomass early FY2023/24. Limited numbers still allocated to coal. Dunedin Energy Centre: Pioneer owns both the boiler house and associated assets. The land on which the boiler house is located is leased from Southern to Pioneer. Southland Hospital Energy Centre: The boiler house and the assets are leased to Pioneer. Both emissions reported under Cat 2 purchased steam as Pioneer has operational control over both energy centres. This now falls under steam purchased from biomass. Dunedin Hospital changed over from coal to biomass in May 2023 | High quality - Based on used coal and steam sold. It is assumed the supplier reports are accurate. Based on caloric value testing to calculate consumption in GJ |
| GJ | Custom Biomass CH4 - N2O CAT2 - GJ | | Dunstan and Dunedin sites. Dunstan Hospital Energy Centre: The land is leased but Pioneer owns assets. Included as Cat2. In May 2023, the coal boiler of Dunedin Energy Centre was converted from coal to biomass woodchip. |
| **Category 3** | | | | | | |
| **Source** | **Data source** | **UOM** | | **Emission factor** | **Boundary or dataset comments** | **Uncertainty** |
| Air travel staff (contracted providers) | Orbit - House of Travel | kgCO2e | | Direct KgCO2e | Direct kgCO2e used as most accurate source of emissions directly attributable to flight emissions associated with flights paid for by Health NZ. Difficult to attribute flights by class and type, so will need to be updated and improved for FY2023/24. | High quality - It is assumed the supplier reports are complete and accurate. |
| FcM | Separate files and uploads for patient and staff flights. Emissions calculated from pkms travelled by class and flight type. |
| Tandem | pkm | | Domestic - National average - With Radiative Forcing; Short-haul (<3700km) -Economy, Business class - passenger - With Radiative Forcing; Long-haul (>3700km) - Economy, Premium, Business class passenger - With Radiative Forcing | Limited to staff travel as no patient travel under this provider. |
| You Travel - local provider. | Short-haul premium economy flights linked to short-haul - Business class EF |
| Air NZ - direct | tCO2e | | AirNZ's default tCO2e. | Accuracy has improved as data now generated in monthly reports directly from AirNZ carbon tool. |
| Sunair | L | | Aviation fuel (kerosene) / Jet A1 - litre | Doctor flights Te Tai Tokerau | High quality - based on trips, flight hours and plane fuel consumption |
| Air Napier | Doctor flights Hawkes Bay |
| Mainland air | Doctor flights Southern. |
| Air travel staff reimbursed claims. | Through District reimbursement claims, finance and payroll extracts | $ (translated to pkm estimate) | | Domestic - National average - With Radiative Forcing; Short-haul (<3700km) - Economy, Premium (Average), Business class - passenger - With Radiative Forcing; Long-haul (>3700km) - Economy, Premium, Business class passenger - With Radiative Forcing | No actual flight data is available for most Districts. Emissions are based on expenditure data and translated into estimates for PKM per flight type. | Low quality - The flight expenditure within staff reimbursement claims is often not extractable in the various finance systems, and flight data is mostly not collected. For several Districts, assumptions must be made to estimate % flight expenditure within total staff reimbursed expenditure. Estimated breakdown PKM for different air travel sources is based on the % breakdown of a small set of actual flight data available. A large set of assumptions must be made based on a small dataset of available flight data to estimate emissions. |
| Rental cars AoG | FcM | km | | Passenger Vehicle - Petrol Vehicle - Rental - Km  Passenger Vehicle - Diesel Vehicle - Rental - Km  Passenger Vehicle - Electric Vehicle - Rental - Km | FY2023/24 inventory excludes rental cars as considered de minimis | High quality - It is assumed the supplier reports are complete and accurate. |
| Rental cars AoG  Ambulance - patients | Tandem | km | | Passenger Vehicle - Petrol Vehicle - Rental - Km | St John data based on E-road emission extract of vehicles providing frontline services. Includes Emergency (EAS) and patient transfer services (PTS) for Health New Zealand | Te Whatu Ora. ACC trips cannot not be filtered out for EAS. % deduction in mileage based on joint funding agreement with ACC and Health NZ. EAS split 46 % ACC and 54% Health NZ. PTS is 100% Health NZ. | High quality - It is assumed the supplier reports are complete and accurate.  High quality - It is assumed the supplier reports are complete and accurate. Small uncertainty over the allocation of Km to ACC |
| Orbit | Vehicle KgCO2e direct |
| St John | Passenger Vehicle - Diesel Vehicle - 2000–<3000 cc - 2015 to 2020 - Km |
| Ambulance - patients  Patient National Travel Assistance (NTA) Claims | Free Wellington Ambulance | kgCO2e | | kgCO2e | Data based on E-road emission extract of vehicles providing frontline services. Includes Emergency and patient transfer services for Health NZ. Distribution over districts based on % on number of jobs. | High quality - It is assumed the supplier reports are complete and accurate. |
| Pro Med | km | | Passenger Vehicle - Diesel Vehicle - 2000–<3000 cc - 2010 to 2015 - Km | Southern only | High quality - It is assumed the supplier reports are complete and accurate.  High quality - It is assumed the NTA reports are complete and accurate. |
| Health NZ- SOS | km | | Private car default - petrol- km | NTA mileage reimbursement claim is 28 cents per total km travelled until end May and then 34 cents for the remainder of FY2023/24.  Units to the whole are return trips, 0.5 reflects a one-way, 1 is a return. NTA expenditure is ex GST, too. |
| Patient National Travel Assistance (NTA) Claims  Helicopter - patients | Te Whatu Ora- SOS  HNZ National Ambulance Services Office (NASO) | Pkm | | Domestic - National average - With Radiative Forcing; | Air travel Minor expenditure within NTA claims. Air Travel reimbursement of dollar value. Currently included as 1 km flown domestically per $. Requires further refinement | High quality - It is assumed the NTA reports are complete and accurate.  High quality - It is assumed the provided reports are complete and accurate. |
| Pkm  $ | | Taxi | Reimbursement of taxi claims. Data is ex-GST |
| Custom emission factor - Public transport - $ | Public Transport: Bus, Ferry, and train on providing a receipt. This also includes transport providers like St. Johns, Driving Miss Daisy, and Shuttle services that aren't taxi services. |
| ppn | | Accommodation domestic - nights | Accommodation. NTA accommodation numbers are based on the number of units in the data extract. Whole units are one night of accommodation at a reimbursement rate of $100 per night. Anything over this, the client will need to pay |
| Hrs | | Helicopter Eurocopter AS350B3 Squirrel - Hrs | Helicopter hours include all hours paid by Health NZ. National contract, which includes subcontracted services. Data inputs on the District/department that commissioned the flight, not on retrospective flight billing. Hours of SOSO - skids off, skids on |
| Patient air travel – Fixed Wing and airlines | Skyline Aviation | Hrs | | TWO Aviation fuels - B350 - hours | Flights for ACC, Ministry of Health (MoH), Organ donation, and transport are filtered out of datasets as they are not invoiced to Health NZ. | High quality - It is assumed the supplier reports are complete and accurate. |
| Patient air travel – Fixed Wing and airlines  Accommodation Travel contracts | Skyline Aviation  Life Flight Trust | Hrs  Litres | | TWO Aviation fuels - B200 - hours | Flights for ACC, MoH, Organ donation, and transport are filtered out of datasets as they are not invoiced to Health NZ.  Patient data is divided by the number of patients on the flight and disaggregated into districts based on domicile. | High quality - It is assumed the supplier reports are complete and accurate. |
| TWO Aviation fuels - C90 - hours |
| TWO Aviation fuels - 400XT - hours |
| TWO Aviation fuels – Sovereign - hours |
| TWO Aviation fuels – Mustang - hours |
| Aviation fuel (kerosene) - litre (Cat 3) |
| Stewart Island Flights | Litres | | Aviation fuel (kerosene) - litre (Cat3) | All flights recorded as 0.85 hours |
| Garden City Aviation | Litres  tCO2e | | Aviation fuel (kerosene) - litre (Cat 3)  AirNZ's tCO2e number. | ACC and training flights were removed. Some flights do not have district charges entered, so some assumptions made based on airport codes to allocate to district-level |
| Philips Search and Rescue | Receive aggregated totals for each quarter, not individual flights. Monthly data is the quarterly data divided by the number of months. |
| Air NZ - direct patient credit cards | Data pulled directly from AirNZ portal |
| Tandem- Health NZ patients NTA | pkm | | Domestic - National average - With Radiative Forcing; Short-haul (<3700km) - Economy, Premium, Business class - passenger - With Radiative Forcing; Long-haul (>3700km) - Economy, Premium, Business class passenger - With Radiative Forcing | Patient data is included in Tandem set with staff data. |
| Orbit - Patients | kgCO2e | | Direct KgCO2e | Patient data included in Tandem set with staff data |
| Air Wanganui | Litres | | Aviation fuel (kerosene) - litre (Cat 3) |  |
| Air Gisborne | Litres | | Aviation fuel (kerosene) - litre (Cat 3) | Tairawhiti District only |
| Orbit - House of Travel | ppn | | Accommodation factors MfE per night domestic and international | Accommodation is included only for accommodation booked with our contracted travel service providers.It excludes accommodation reimbursed through staff reimbursement claims, including Continuing Medical Education claims. |
| Accommodation Travel contracts  **Category 4** | FcM | ppn | | Accommodation factors MfE per night domestic and international | Accommodation is included only for accommodation booked with our contracted travel service providers.It excludes accommodation reimbursed through staff reimbursement claims, including Continuing Medical Education claims. | High quality - It is assumed the supplier reports are complete and accurate. |
| Tandem |
| You Travel - local provider. |
|  |
| **Source** | | | | | | | **Data source** | **UOM** | **Emission factor** | **Boundary or dataset comments** | **Uncertainty** |
| Waste to landfill – General waste | Waste Management | Kg | | Waste General Waste with LFGR - kg Waste General Waste without LFGR - kg. | Lakes – Taupo and West Coast – Greymouth waste goes to landfill without gas recovery. All other landfill sites used by Waste Management have landfill gas recovery (LFGR) | High quality - It is assumed the supplier reports are complete and accurate. |
| Waste to landfill – General waste  Medical waste to landfill and incineration | Envirowaste | Kg  Kg | | Waste General Waste with LFGR - kg. | Assumed all waste goes to landfill with landfill gas recovery | High quality - It is assumed the supplier reports are complete and accurate.  High quality - It is assumed district inputs were recorded accurately |
| Northland Waste | Waste General Waste with LFGR - kg | Northland waste Puwera landfill with LFGR |
| Northland regional landfill | Waste General Waste with LFGR - kg. | Puwera landfill with LFGR |
| District inputs various templates. | Waste General Waste with LFGR - kg. Waste General Waste without LFGR - kg | Hawkes Bay: Hastings District Omaranui with LFGR, Wairoa no LFGR. |
| Corporate offices | Waste with gas recovery (unknown composition) - Office Waste - Kg | For several corporate leased offices where waste is part of the lease or unavailable, waste has been estimated at 8.3 kg/desk/year. | Medium - some estimated office waste |
| Interwaste | Custom emission factors cytotoxic - kg Custom emission factors medical/clinical/ sharps waste - kg Waste General Waste with LFGR -kg. | All landfills used for medical waste and sharps have landfill gas recovery. Cytotoxic waste is incinerated in Australia. The Interwaste dataset includes the pharmacy waste category, including waste from hospitals pharmacies, covid centres and community pharmacies. Community pharmacies are out of scope but are included in waste inventory as it is unclear which is which. Overestimation of estimated 10-30 tonnes of waste total. | High quality - It is assumed the supplier reports are complete and accurate. |
| Medical waste to landfill and incineration  Distributed energy | Waste Management | Kg  kWh | | Custom emission factors cytotoxic - kg Custom emission factors medical/clinical/ sharps waste - kg Waste General Waste with LFGR -kg.  Custom emission factors cytotoxic - kg | All landfills used for medical waste and sharps have landfill gas recovery. The dataset of Waste Management includes some community pharmacies. Community pharmacies are out of scope but are included in waste inventory as it is unclear which is which. | High quality - It is assumed the supplier reports are complete and accurate.  Medium - estimation of volumes based on audit |
| West Coast District | Greymouth Hospital. Onsite incinerator for medical waste. Volumes per year based on audit 70 bags per day x 5kg each x 365 days = 127,750 kg per year or 10,646 kg/month. Emission factor cytotoxic incineration is used. |
| Canterbury District | Electricity - kWh | Electricity purchased by Canterbury District but on charged and distributed to the University of Otago. | High – based on submeter reading |
| Transmissions and distribution losses | Derived from electricity inputs | kWh | | Electricity - kWh | Calculated in tool based on electricity consumption using T&D loss EF | High quality - derived from energy meter data |
| Transmissions and distribution losses  Water and wastewater | Derived from gas inputs | GJ | | GJ | Calculated in tool based on gas consumption using T&D loss EF | High quality - derived from energy meter data  Low to medium quality. Several hospitals have no water recordings, or water readings are only read at infrequent intervals. Estimates based on NABERSNZ Hospital benchmark formulas have been used to estimate predicated water consumption to complete gaps. |
| Water | m3 | | Water Supply - m3 | Includes water of all district hospital sites and sites under direct contract. Leased offices excluded. No data is available for several sites. |
| Water and wastewater | Wastewater | m3 | | Domestic Wastewater average - m3 | Based on water inputs, assumed water in is water out | Low to medium quality. Several hospitals have no water recordings, or water readings are only read at infrequent intervals. Estimates based on NABERSNZ Hospital benchmark formulas have been used to estimate predicated water consumption to complete gaps. |
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1. Throughout this document ’GHG Protocol’ refers to the GHG Protocol Corporate Accounting and Reporting Standard and ’ISO 14064-1:2018’ means the international standard Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals. [↑](#footnote-ref-2)
2. Henceforth referred to as ‘emissions’ [↑](#footnote-ref-3)
3. Henceforth referred to as ISO 14064-1 [↑](#footnote-ref-4)
4. Natural Gas and Electricity figures include transmission and distribution losses (T&D). Coal figures include steam from coal purchases. [↑](#footnote-ref-5)
5. Pae Ora (Healthy Futures) Act 2022, s 7(e) [↑](#footnote-ref-6)
6. https://sbc.org.nz/ [↑](#footnote-ref-7)
7. https://greenhospitals.org/ [↑](#footnote-ref-8)
8. https://www.linkedin.com/company/sustainable-health-sector-national-network-aotearoa/?originalSubdomain=nz [↑](#footnote-ref-9)
9. https://www.wasteminz.org.nz/ [↑](#footnote-ref-10)
10. Based on recorded FTE in the Health Workforce Information Programme as of 31 March 2023. FTE total excludes FTE from subsidiaries. [↑](#footnote-ref-11)
11. Based on recorded patient Length of Stay days in the National Minimum Dataset of hospital events (NMDS) as at 31 July 2024. [↑](#footnote-ref-12)