



GREENHOUSE GAS EMISSIONS INVENTORY REPORT

Inventory Scope: Mainfreight Group

Reporting Period: 1 April 2023 to 31 March 2024

Version: 1.0

Level of Assurance: Reasonable for all categories

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CHAPTER 1: GENERAL DETAILS, PURPOSE AND POLICY

1.1 Introduction

The following document provides the Mainfreight Group of companies' full greenhouse gas (GHG) emissions inventory for the 2024 Financial Year – April 2023 to March 2024.

Mainfreight's reporting processes and emissions classifications are consistent with international protocols and standards. This report has been prepared in accordance with the *International Standards Organisation* standard *ISO 14064-1:2018*. The information provided follows the requirements outlined in Part 9.3.1 and (where applicable) 9.3.2 of the standard.

1.2 Purpose

Mainfreight's intent here is to demonstrate best practice with respect to consistency, comparability and completeness in the accounting of greenhouse gas emissions.

This report:

- Relates to emissions for the Mainfreight Group of companies.
- Has been prepared in accordance with the requirements of the ISO 14064-1: 2018 standard.
- Endeavours to use primary data wherever possible but especially surrounding all major emissions sources. Where primary data is not available, a consistent and conservative approach to calculation will be applied.
- Reflects our commitment to better understanding and ultimately improving our operational performance with respect to emissions.
- Excludes specific targets.

1.3 Description of Mainfreight

Mainfreight is a supply chain and logistics provider with 337 branches worldwide offering full solutions across warehousing, international air and ocean freight and domestic forwarding. Mainfreight is a New Zealand Stock Exchange listed company (MFT: NZX). The company is made up of "Mainfreight NZ Limited" (the 'Parent') and its subsidiaries (together the 'Group').

For further information see www.mainfreight.com.

1.3.1 GHG and Sustainability Policies, Strategies and Programmes

Mainfreight's 100-year vision, established in its earliest days, has been a guiding principle in our commitment to sustainability. All decisions are made on the basis that we will be here for another 100 years and are aligned with the key concepts of sustainability: investing in our people and communities, reducing the environmental impact of our activities, supporting our customer, supplier and stakeholder relationships, and developing our growth strategies.

Climate change remains a defining issue for businesses and governments everywhere. For Mainfreight, it begins with accepting that our business is based on an activity that generates greenhouse gas emissions and

therefore taking responsibility to reduce those emissions over time, while maintaining our competitiveness and ability to deliver quality services as our customers expect.

Mainfreight's commitment to sustainability, safety, health and the environment has been, and continues to be, a fundamental element of our operating practices and success to date. For more on Mainfreight sustainability please visit: <https://www.mainfreight.com/global/en/global-home/about-us/sustainability.aspx>.

1.4 Persons Responsible

The provided GHG Inventory and Report has been prepared by the New Zealand based team, with significant support from many parties across all major operating regions.

Overall responsibility lies with Tim Williams, Chief Financial Officer.

Responsibility for the preparation of the report and inventory:

- Jodi McLaren, Business Development & Sustainability – New Zealand

Assisting with background data and supporting information:

- Graeme Illing, Financial Controller – New Zealand
- Shaun Morrow, Sustainability Programme Manager – New Zealand
- Alvin Datt, Financial Controller – New Zealand
- Raju Vegesna, Accountant – New Zealand
- Harrison Irvine, Sustainability Team – Australia
- Paige Rigopoulos, Sustainability Team – Australia
- Leigh Vlasblom, National Finance Support – Australia
- Richard Vlasblom, Financial Controller – Australia
- Joyce Wain, Financial Accountant – Australia
- Jessica Almonte, Financial Controller – Americas
- Ajanae Huner, Financial Controller – Americas
- Justin Remack, Chief Finance Office – Americas
- Erik Berger, Financial Controller – Americas
- Shirly Liu, Financial Controller – Asia
- Franky Lui, Financial Controller – Asia
- Remy Rosendahl, Business Solutions – Europe

1.4.1 Team Training for the Preparation of this Emissions Inventory and GHG Report

Members of the core inventory preparation team are trained on the principles and requirements within the ISO 14064-1:2018 standard.

Each year the inventory preparation team provide regional contributors with a detailed data input template and instructions on collection of data in line with the standard. Workshops are then arranged with each regional team around their contributions.

In 2023, following the preparation and publishing of the 2022 Calendar Year GHG Inventory report a detailed post audit review was conducted. Our emissions reporting processes were then discussed at the Group Financial Controllers meeting held in the Netherlands in late 2023.

1.5 Audience and Dissemination Policy

This report is intended for all Mainfreight stakeholders interested in its greenhouse gas emissions inventory and the associated reporting structure, notation and explanations. It is provided publicly on our website following appropriate third-party verification.

1.6 Reporting Period and Frequency of Reporting

This GHG report covers the financial year 1 April 2023 to 31 March 2024.

Mainfreight are a designated Climate Reporting Entity as part of the New Zealand Climate Related Disclosure standards. In order to align with these standards, we have adapted our reporting period to Financial Year from year ending 31 March 2024.

In previous reports we have used the calendar year as our reporting period. A three-month Bridging Inventory has been included as Appendix 1 to this report, to cover 1 January to 31 March 2023.

GHG reports are produced annually.

1.7 Reporting Standards, Approach and Verification

1.7.1 Compliance with ISO 14064-1:2018

The GHG report for the year ending 31 March 2024 has been prepared in accordance with ISO 14064-1:2018. A reporting index has been provided in Appendix 2.

1.7.2 Audit of GHG Inventory

Verified to reasonable assurance for all categories by Toitū Envirocare.

CHAPTER 2: ORGANISATIONAL BOUNDARIES

2.1 Consolidation Approach

Mainfreight utilises the ‘operational control’ consolidation method for our emissions inventory. This approach considers all emissions that Mainfreight exercises some control over but not necessarily financial control (all financially controlled entities are also included).

The most significant application of this approach is the inclusion of emissions from our owner drivers, agents, rail providers, shipping lines and airlines that support our service offering to customers.

A small number of franchises, although related to the Mainfreight Group, are not considered under its control and have not been included in the emissions summary. Emissions for transportation services to and from franchises as part of our network are included.

2.2 Organisational Chart

The below organisational chart depicts the operating nature of the Mainfreight Group as is relevant to the emissions summary.

Mainfreight has 337 branches across five regional operations, 4 of which run our 3 key service platforms, with Asia largely focused on the Air & Ocean division along with a small warehousing footprint.

The formal Group Structure is provided as Appendix 3.

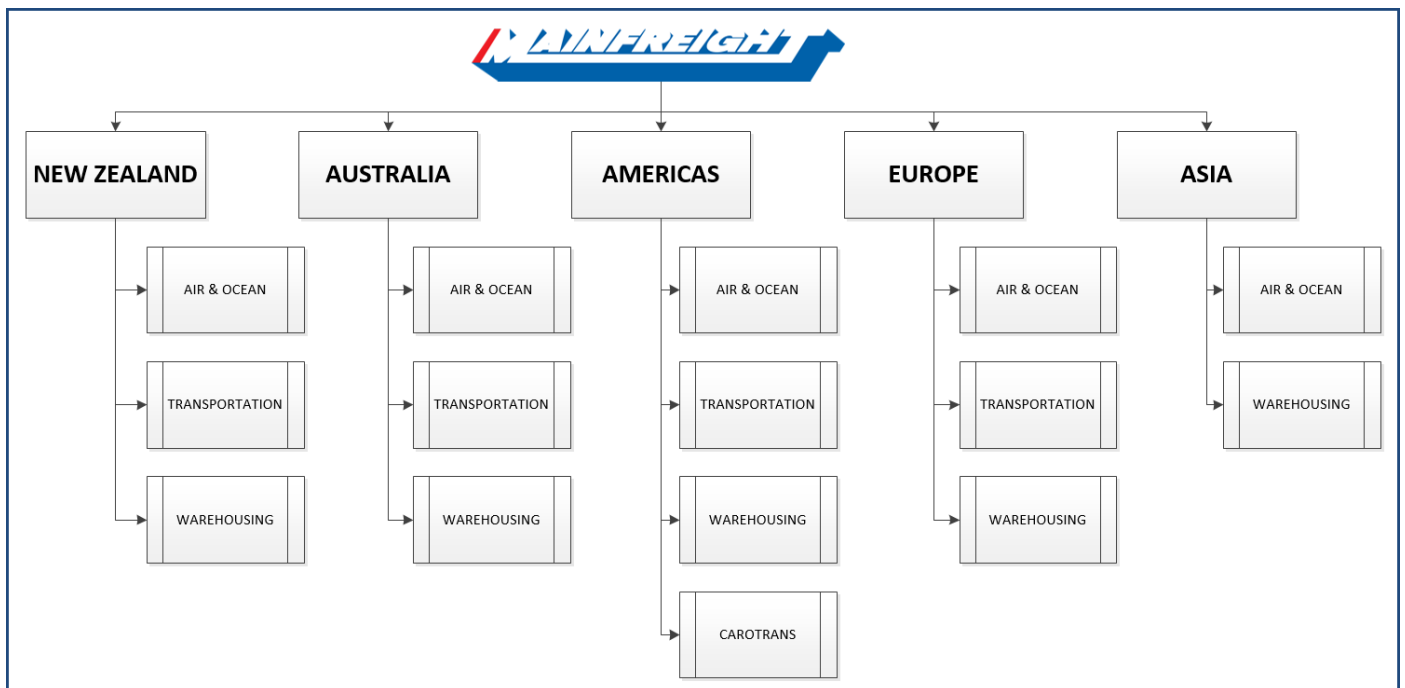


Figure 1: Mainfreight Operational Organisation Chart

CHAPTER 3: REPORTING BOUNDARIES

3.1 Emissions Categories and Classification

Greenhouse gas emissions sources have been identified and grouped in accordance with the ISO 14064-1:2018 standard. This methodology lists six categories of emissions and differs somewhat from earlier categorisation in line with the Greenhouse Gas Protocol's Scopes 1 through 3.

- Category 1: Direct GHG emissions and removals
- Category 2: Indirect GHG emissions from imported energy
- Category 3: Indirect GHG emissions from transportation
- Category 4: Indirect GHG emissions from products used by the organisation
- Category 5: Indirect GHG emissions associated with the use of products from the organisation
- Category 6: Indirect GHG emissions from other sources

3.2 Significance and Materiality

Factors for consideration in assessing significance and materiality include:

- Size of the emissions
- Mainfreight's influence on the emission source
- Difficulty in obtaining data
- Poor validity in available estimation approaches

Whilst all of the above would be considered in materiality assessments, the criteria that would mandate disclosure of emissions sources as significant is:

- a) Where a single source has an estimated emissions likely to be at least 1% of Mainfreight's total emissions, that source must be included.
- b) Where the total of 'insignificant' sources have estimated emissions likely to be at least 5% of Mainfreight's total emissions, enough of those must be included to bring the excluded total below 5%.

3.3 Summary of Emissions Source Inclusions

Category	Emission Source	Data Source	Methodology & Materiality
1	Biofuels used	Fuel billing	Fuel use in litres
1	Fuel used by owner drivers	Fuel billing	Fuel use in litres
1	Fuel used by company trucks	Fuel billing	Fuel use in litres
1	Fuel used by company/rental cars	Fuel billing	Fuel use in litres
1	Fuel use for mileage expensed	Expense accounts	In kms or litres
1	Tkm for transport where fuel is not available	TMS reports [1]	Where fuel is sourced externally Tkm are used
1	Fuel for material handling equipment	Fuel reports [2]	In litres or kg
1	One-off refrigerant leakage event	Top up billing	Top up volume x by GWP
2	Electricity	Electricity billing	By kWh
2	Energy from gas sources (heating)	Fuel billing	In m ³
3	Tkm Road (third party carriers)	TMS reports	Summary road Tkm by third party carrier
3	Tkm Rail	TMS reports [4]	Summary Tkm by mode rail.
3	Tkm and TEU-km Sea	Shipments & Port-Port km [5]	Summary of Shipment port-port distance x weight, TEU
3	Tkm Air – Short haul (<1000km), Medium haul (1000-3700km) and Long haul (>3700km)	Shipments & Port-Port km	Summary of Shipment port-port distance x weight
3	Business Travel	Provider reports on emissions/kms	Direct emissions reports or km summaries
4	Waste – Landfill	Provider reports on tonnes	Tonnes of general waste (assumed)
4	Waste – Recycling	Provider reports on tonnes	Tonnes of general recycling
4	Electricity transmission and distribution losses	Electricity billing	kWh input at T&D emission factor
4	WTT emissions associated with fuel extraction and refining	Fuel billing [6]	Fuel x appropriate WTT fuel emission factor
6	Accommodation	Provider reports	Direct reports or per night

Table 1: Emissions Source Inclusions

Notes to Table 1

1. We operate our own bespoke Transport Management System (TMS) and run specific queries to produce summary details on Tkm by mode.
2. Different regions use different fuel types (i.e. LPG vs natural gas) and measures (kg vs litres), electric MHE would be accounted for in 2.1.
3. Diesel assumed for all regional rail factors. NZ and AU use supplier factors.
4. A Port-Port (and Airport-Airport) table has been developed as a reference tool. For international container freight TEU-km is the preferred unit. Our sea freight factors follow the Clean Cargo Working Group.
5. WTT emissions are not a required inclusion per the MfE 'Measuring Emissions: Guide for Organisations (2023)'. But as a consumed product (Category 4) with a material impact we have included the upstream emissions for this area (for Categories 1 and 2).

3.4 Summary of Emissions Source Exclusions

The following emissions sources have been identified but excluded from the emissions inventory. These sources are not considered significant or material to stakeholders (see 3.2), the context of the inventory, and/or are not feasible or practical to calculate at the current point in time.

Category	Emission Source	Data Source	Methodology & Materiality
1	Fugitive emissions from air conditioning systems including chilled transport	[1], [2]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
1	Fumigants for treatment of product/equipment for export	[3]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
1	Emissions from workshop operations e.g. welding	[4]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
2	Emissions from charging electric vehicles offsite	[5]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
3	Team commuting		Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
3	International pre and post carriage where Mainfreight is not the service provider	[6]	Difficult to obtain and assign, estimated to be <i>de minimis</i> (<1%)
3	Upstream transportation	[7]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
4	Emissions from use of consumables	[8]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
4	Emissions from use of goods in branches	[9]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
4	Waste emissions for non-transporting services, Carotrans		Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
6	Building and construction projects		Difficult to obtain, estimated to be <i>de minimis</i> (<1%)
	Biogenic emissions excluding biofuels	[10]	Difficult to obtain, estimated to be <i>de minimis</i> (<1%)

Table 2: Emissions Source Exclusions

Notes to Table 2

1. We have 337 branches across different regions and climates, as well as with different ownership and maintenance models. As a result, these figures are especially difficult to obtain.
2. There are a handful of chilled vehicles in our fleet of thousands, maintenance handled by owners. As a result, these figures are especially difficult to obtain.
3. Fumigants are required for some products and equipment to prevent potential spread of pests.
4. We have a small number of workshops on our major sites, these do repair work and some metal fabrication and painting.
5. It is expected that electric vehicles will be charged on site most of the time, which is already captured. We will continue to watch this as our electric fleet grows.
6. Where Mainfreight is the service provider these emissions are captured within our domestic data.
7. As a logistics service provider, upstream transportation for goods purchased is relatively insignificant.
8. Consumables include packaging items like shrink wrap and pallets. While estimated to be below levels of significance, it remains a point of interest for future examination.
9. Obvious goods used include office equipment and stationery.
10. Biogenic emissions for the likes of composting have not been included, known biofuels have.

CHAPTER 4: QUANTIFIED GHG INVENTORY OF EMISSIONS

4.1 Consolidated Statement of Greenhouse Gas Emissions

EMISSIONS	Notes	CO2e TOTAL (Tonnes p.a.)	Carbon Dioxide (CO2)	Methane Non/Fossil Origin (CH4)	Nitrous Oxide (N2O)	Hydrofluoro- carbons (HFCs)
Direct emissions in tonnes CO2e						
1 Category 1: Direct GHG emissions and removals in tonnes CO2e		303,308	298,629	534	3,948	197
Direct emissions from stationary combustion		303,308	298,629	534	3,948	197
Direct emissions from mobile combustion		303,111	298,629	534	3,948	
Direct process and removals from industrial processes						
Direct fugitive emissions from the release of GHGs in anthropogenic systems		197				197
Direct emissions and removals from land use and forest change						
2 Direct emissions in tonnes of CO2 from biomass		0.80	0.80			
Indirect emissions in tonnes CO2e		1,187,448				
2 Category 2: Indirect GHG emissions from imported energy		16,798				
Indirect emissions from imported electricity		16,798				
Indirect emissions from imported energy						
3 Category 3: Indirect GHG Emissions from Transportation		1,082,068				
Emissions from upstream transportation and distribution of goods		NS				
Emissions from downstream transportation and distribution of goods		1,077,678				
Emissions from employee commuting		NS				
Emissions from client and visitor transport		NS				
Emissions from business travels		4,390				
4 Category 4: Indirect GHG emissions associated with the use of products by the organisation		88,581				
Emissions from purchased goods and services		3	79,141			
Emissions from capital goods		NS				
Emissions from the disposal of solid and liquid waste		9,440				
Emissions from the use of assets		NS				
Emissions from other services not described above						
5 Category 5: Indirect GHG emissions associated with the use of products from the organisation						
Emissions or removals from the usage of product		NS				
Emissions from downstream leased assets		NS				
Emissions from end of life stage of the product		NS				
Emissions from investments		NS				
6 Category 6: Other indirect GHG emissions sources		NS				
TOTAL EMISSIONS CATEGORIES 1 - 6		1,490,756				
REMOVALS		4				
Direct removals in tonnes CO2e						
Emissions Liabilities		5				
Total Storage as of year end in tonnes CO2e		8,944				
Other Related Information						
Performance tracking (emissions and removals by metric)			Greenhouse Gas Emissions Inventory Report			5
Base year GHG emissions, removals and stocks; and adjustments to base year			Greenhouse Gas Emissions Inventory Report			4.6
Disclosure of most significant sources and sinks			Greenhouse Gas Emissions Inventory Report			3.3
Emissions Liabilities			Greenhouse Gas Emissions Inventory Report			4.3
Significance criteria			Greenhouse Gas Emissions Inventory Report			3.2
Uncertainty assessment			Greenhouse Gas Emissions Inventory Report			4.5

[NS] Non significant

Notes to Consolidated Statement of Greenhouse Gas Emissions

1. *Direct and indirect emissions have been prepared in accordance with the recommendations of Annex B. Gas types CO₂, CH₄, N₂O and HFCs have been included as those relevant to direct emissions.*
2. *Biomass emissions relate to the use of biofuels, while not significant in scale they are an area of interest and as such are included here. As per the ISO 14064-1: 2018 Standard the CO₂ emissions are recorded against biomass whereas the other gases (CH₄, N₂O etc are grouped within Category 1).*
3. *This includes electricity transmission and distribution losses. WTT (Well To Tank) emissions have also been included as emissions from purchased goods and services.*
4. *This document does not provide any recommendations or requirements for removal.*
5. *Emissions liabilities are denoted here but not included in the emissions total. For further details see section 4.2.*

4.2 Methodologies for the Collection and Quantification of Data

As an enterprise spanning regions across the globe, the collection of emissions data spans a broad range of localities and consequently, service providers and data sources. As a result, source data varies in both format and degree of detail.

The emissions summary represents a best attempt to consolidate and standardise emissions data and provide a detailed explanation of working and estimation in line with the ISO 14064-1:2018 standard.

Due to the short turnaround for report publication at the end of the financial year, not all primary data sources had been issued or available at the time of compiling our inventory. In such cases, we have taken 11 months of actual data and extrapolated this to give an estimation of the full year. Over 90% of our total emissions footprint comes from freight movements, which have all used data for the full Apr23-Mar24 period.

Due to their access and understanding of Group reporting and data sources, Mainfreight's finance team have led the data collection efforts to date.

Section 3.3 describes the overview of emissions sources and their respective data sources. Where an estimation approach is required, the best available data and calculation method is applied. Where two or more estimation approaches are considered equally valid, that which produces the more conservative figure is used.

4.2.1 Approach to Emission Factors

Where possible, emission factors are specific to each reporting region. Where specific regional emission factors are not available or applicable, we have taken the most relevant as suggested by the website <https://emissionfactors.com/>. Sources include:

- IPCC 6th Assessment Report
- NZ Ministry for the Environment Guidance for Voluntary GHG Reporting – 2023
- USA EPA - Emission Factors for Greenhouse Gas Inventories 2024
- UK Department for Business, Energy & Industrial Strategy 2023
- Australian National Greenhouse Accounts Factors: 2023
- Australian Energy Market Operator
- US Energy Information Administration
- Corporate Traveller and EcoTransIT World
- Cornell Hotel Sustainability Benchmarking Index (CHSB) Tool 2023
- Statista.com
- KiwiRail Steel Wheels Report

4.2.2 Changes in Methodologies on prior year/base year

The 2018 calendar year was the first GHG report published by Mainfreight, it provides the base year for the original assessment and for future years. The following represent changes in methodology with respect to the base year and our commitment to improve the accuracy and breadth of reporting year on year:

- Shift to following our financial year of April 2023 – March 2024.
- Emission factor updates.
- Improvements identified from our own post audit review, across data sourcing, quality, completeness and consistency.
- Improved 'follow the freight' for shipment leg level detail across LCL consolidations.

4.2.3 GWP Calculation and Source

Quantities of GHG emissions are expressed as tonnes of CO₂e (Carbon Dioxide Equivalents) using the global warming potentials (GWP) from the IPCC Sixth Assessment Report (AR6). The time horizon is 100 years.

Direct emissions sources (Category 1) are expressed as both CO₂e and their detailed GHG breakdown, including the GWP (Global Warming Potential) value. The most notable GHGs include:

GHG	Chemical Formula	GWP
Carbon dioxide	CO ₂	1
Methane (Fossil Origin)	CH ₄	29.8
Methane (Non-Fossil Origin)	CH ₄	27
Nitrous oxide	N ₂ O	273
Hydrofluorocarbon R410A	R410A	2088

Table 3: Greenhouse Gases and their respective Global Warming Potentials

4.2.4 GHG Liabilities

Mainfreight operates a small number of chilled storage facilities across New Zealand, Australia and Europe.

The refrigerants used to maintain temperature at these sites have extremely high GWP. As a result, despite relatively small volumes, their potential impact could be arguably significant.

GHG liabilities have been included separately in our emissions inventory to denote the risk associated with this pool of emissions were it to be released (by accident or leakage). Emissions liabilities are not included in the totals of our emissions count per the ISO 14064-1:2018 standard.

The provided GHG liabilities for Mainfreight are:

Region	GHG Liability / Site	Refrigerant	GWP	Quantity	GHG Liability
New Zealand	107 Westney – Chiller System 1, Freezer	R404A	3943	95kg	374.59T
New Zealand	107 Westney – Chiller System 2, ELA & Chillers	R134A	1300	190kg	247T
New Zealand	107 Westney – Chiller System 3, Chillers	R404A	3943	90kg	354.87T
New Zealand	107 Westney – Coolstore Complex 2	R1270	2	14kg	0.03T
New Zealand	Christchurch Airfreight – Chiller	R407F	1674	395kg	661.23T
Europe	Born – Warehousing Chiller	R449A	1397	12kg	16.76T
Europe	Zaltbommel - Warehousing Chiller	R410A	1924	9kg	17.32T
Australia	Epping – Chiller	R404A	3943	50kg	197.15T
Australia	Prestons - Chiller	R410A	1924	27kg	51.95T
Australia	Moorebank - Chiller	R32	677	384kg	259.97T
Australia	Kookaburra - Chiller	R134A	1300	43kg	55.9T
Australia	Regency Park - Chiller	R134A	1300	54kg	70.2T
Australia	MFT Dandenong – Chiller	R410A	1924	304kg	584.9T
Australia	MFT Dandenong – Chiller	R404A	3943	162kg	638.77T
Australia	SpringBank - Chiller	R404A	3943	680kg	2681.24T
Australia	MeadowBank - Chiller	R404A	3943	600kg	2365.8T
Australia	EagleFarm - Chiller	R134A	1300	52kg	67.6T
Australia	EagleFarm - Chiller	R449A	1397	92kg	128.52T
Australia	MFW - Perth - Office & Chiller	R134A	1300	64kg	83.2T
Australia	MFW - Perth - Office & Chiller	R32	677	1kg	0.68T
Australia	MFW - Perth - Office & Chiller	R410A	1924	43kg	82.73T
Australia	MFW - Perth - Office & Chiller	R404A	3943	1kg	3.94T
GROUP	Total				8944.35T

Table 4: GHG Liabilities

GWP Sources: [DEFRA 2023](#) and [Cooling Equipment Ltd](#)

Liabilities excluded based on expected values below levels of significance or relevance include:

- Refrigerators and cool rooms as part of our canteens
- Refrigerants within chilled trucks (less than 0.5% of our fleet are chilled)
- Refrigerants within air conditioning systems
- Diesel in backup generators (covered under category 1 purchased fuel)
- Fire extinguishers (numerous but small holding and low GWPs)

4.2.5 Review, Internal Audit and Improvement

Primary data has been sought for all significant emissions sources. Where data is unavailable or not comparable, conservative estimation methods have been applied such that incentives lie in continually improving the ratio of primary data to estimation approaches.

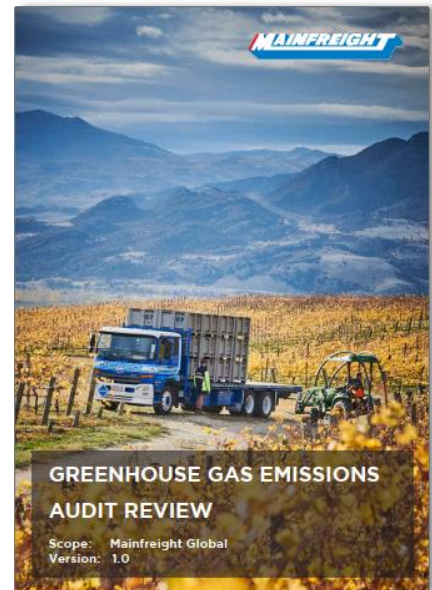
Preparation of the inventory is done iteratively with several internal draft, check and resubmission stages in the lead up to verification as well as online regional workshops.

Following reporting for the 2021 calendar year, a post audit review document was prepared in 2022 and disseminated to the regional preparation teams. It rated individual data sources for quality and completeness and sought to address areas for improvement outlined from previous audit findings.

In 2023 at the Group Financial Controllers' meeting, the team ran through a workshop of areas of improvement. This was the first time that the regional teams had been able to discuss the reporting process in person.

Some improvements identified and enacted include:

- Improved layout of the emissions template – separated into types of activity.
- Addition of emissions categories for different fuel types and units of measure.
- Better data quality and completeness.
- Transition to better units of measure.



4.3 Information Management Procedures

The GHG measurement and reporting process has been developed to ensure conformance to the principles of the ISO 14064-1:2018 standard and to be consistent with the intended use of the GHG inventory.

The procedural elements below are designed to set structure and consistent checks to provide accuracy and completeness of the inventory and address errors and omissions.

Figure 2 outlines the structure and storage approach for documentation. Its intention is to enable relevant access and traceability to the source information of our emissions inventory for our verifiers.

4.3.1 Key Procedural Elements for GHG Information Management

- Regional inventory preparation teams collect source data from third party suppliers and Mainfreight’s finance and transport management systems.
- Data is organised by region and within each region by business unit.
- Documentation is held in an access-controlled folder on Mainfreight’s intranet.
- Data is reviewed and consolidated by the GHG inventory and report preparation team based in New Zealand.
- Emission factors are provided for each region and reviewed annually.
- The emissions inventory and GHG report are independently audited by Toitū Envirocare.
- This GHG report also outlines consideration for the following:
 - Responsibility and authority for inventory development.
 - Review and implementation of training for the inventory development team.
 - Identification of organisational and reporting boundaries.
 - Selection and review of GHG sources and sinks.
 - Details of quantification approaches and consideration to their consistent application.
- Post audit: all data, reports and inventory are copied to an intranet location and archived.

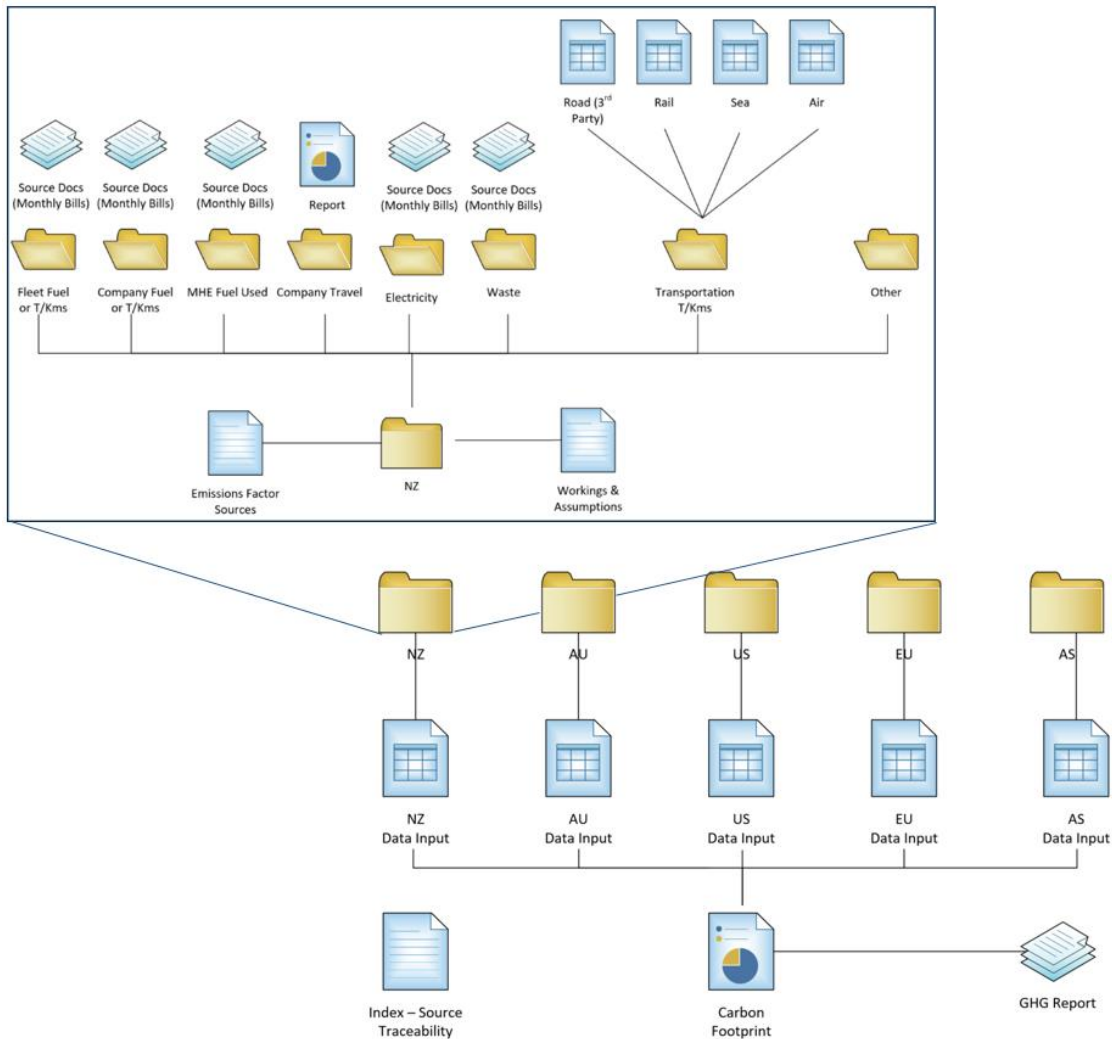


Figure 2: Documentation and Source Information Structure

4.4 Assessment of Uncertainty

For this 2024 report a qualitative rather than quantitative assessment of uncertainty has been applied. With the current tools and variety of emission sources, our view is that a quantitative assessment would be complex, time consuming and offer little validity in respect to statistical uncertainty. The applicability of these quantitative assessments will be reviewed in each reporting period.

The emissions inventory provided in 4.1 carries some degree of uncertainty, which can be heavily associated with two core considerations:

1. Complexity in operations, supply chain party interdependency and data availability

International supply chain networks can be notoriously complex, involve numerous different parties and a huge quantity of data (for even a single shipment). Data availability, systems integration and commercial sensitivity can all inhibit how emissions information might be conveyed and interpreted across the chain.

Nonetheless, we are confident our own technology infrastructure and reporting approach has done the best to minimise uncertainty here and/or describe where the limitations in any approach lie.

2. Variety in maturity and sophistication in data from third party suppliers across all operations

With 337 branches operating across some 27 countries, it is necessary to engage with a large number of third-party suppliers for our local needs - in particular, electricity, waste and different fuel sources. Adding further complexity here is different site operating models - for instance lease or rent arrangements that might include electricity or waste.

Our regional teams have done their best to gather and report back in a consistent fashion. However, it should be noted that these emissions sources are relatively small when compared to our direct emissions across supply chains.

4.6 Changes to Base Year

The base year for emissions inventory assessments is the 2018 calendar year. There are several underlying reasons for the selection of the 2018 calendar year as the base year:

1. Calendar year has been used rather than financial year.
2. As the earliest reported period, 2018 was selected as the base year.

Given that the length of the reporting period is the same, it is still comparable to our latest financial year reporting.

Recalculation of the base year will only be applied where it is necessary to maintain an effective base year comparison. Reasons for this might include:

- If the emission factors used change significantly and are relevant to prior years.
- If a significant estimation method has been changed/improved.
- If a significant data sourcing strategy has been changed/improved.
- If the scope of the inventory is changed (for instance the purchase of a new business).

Recalculation of the base year will also consider whether the historical data has the required detail to perform recalculation or whether it is in the right form (i.e. unit of measure) to apply a different emission factor.

There is no change to the base year calculation in this reporting period. Our previous GHG Reports and Inventories can be found on our website:

<https://www.mainfreight.com/global/en-global/investor/reports-library>.

4.6.1 Recalculations

During comparison of values from prior years, it was discovered that the reported emissions for Carotrans shipping and road freight for the 2022 calendar year were found to be underrepresented:

- TEU-km used the tonne-kilometre calculation, resulting in a lower activity value to which emission factors were applied.
- Road transport used incorrect emission factors, resulting in lower emissions than when using the correct factor.

It was also discovered that the Well-to-tank emissions were calculated for Europe in Category 4, despite the emission factor used for the direct emissions being Well-to-wheel. The resulting variance is 0.4% of the total inventory and therefore does not meet the significance threshold required to re-publish an updated 2022 inventory.

These have all been corrected for in the 2024 Financial Year Inventory.

4.6.2 Category Updates

It was found that in previous inventories, a number of minor emissions sources had been misclassified. From this 2024 Financial Year Inventory onwards, they will be included in the below categories, as per ISO14064-1:2018.

Emission Source	Category in prior inventories	Category in this and future inventories
Rental Cars	Category 1	Category 3
Accommodation	Category 6	Category 3
Natural Gas (Heating)	Category 2	Category 1

4.7 Removals and Reductions / Increases

4.7.1 Removals

There are no emissions removals to declare in this reporting period.

4.7.2 Emissions Reductions / Increases

Year on year we have recorded a **5,870 T decrease** in carbon dioxide equivalents across our business representing a **0.4% decrease** in gross greenhouse gas emissions.

This is positive in the face of increasing air and sea freight volumes although partly offset by reductions in road tonnage.

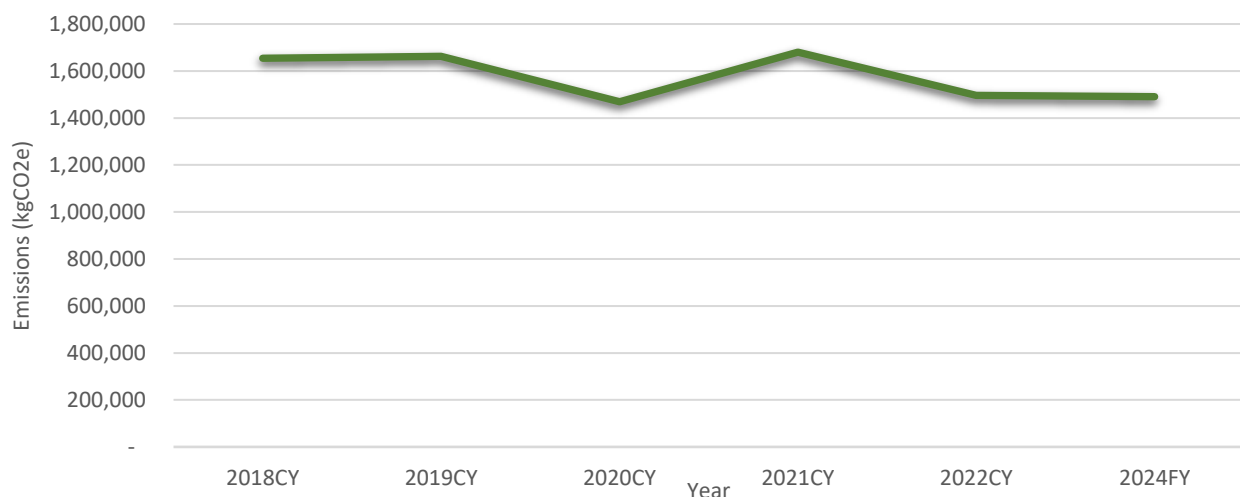
Also positive is a notably greater reduction in road freight emissions relative to a modest reduction in total volumes. This is likely reflective of incremental efficiency gains in vehicles and practices, a small but increasing low emission fleet and a reduction in the use of agents.

Operational emissions have increased reflecting the growth and expansion of our network. This however has two complimentary benefits particularly in support of road freight. Firstly, by allowing us to get closer to customers with larger more efficient modes and secondly by providing better infrastructure for fleet electrification in the future.

Our ongoing performance remains subject to the level of growth within the business particularly as we continue to attract and win market share. We are nonetheless confident that our climate strategy coupled with greater availability in new fuels and technologies will create further opportunities for improvement.

We continue to target reductions in emissions intensity year on year (see Emissions Intensity Measures) while aiming to reduce gross emissions wherever possible.

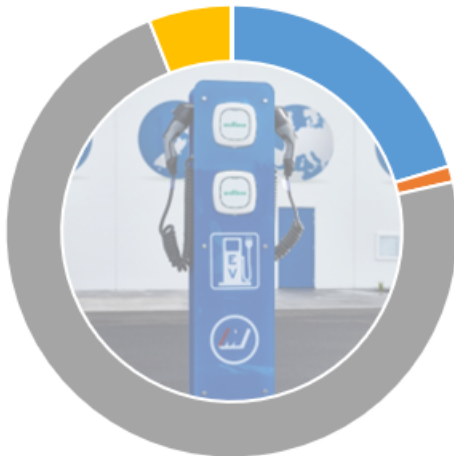
Year on Year Trends - Emissions



CHAPTER 5: INTERNAL REPORTING & PERFORMANCE

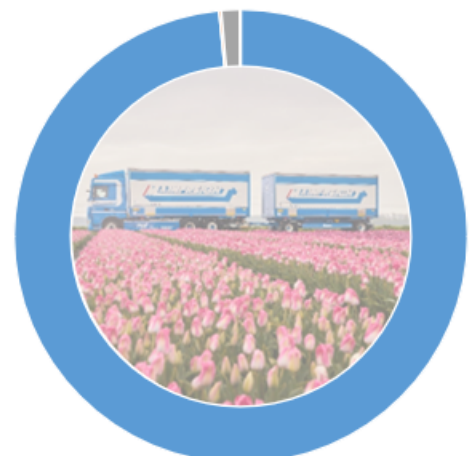
5.1 Emissions by Category, Gas and Freight Mode

Emissions Category



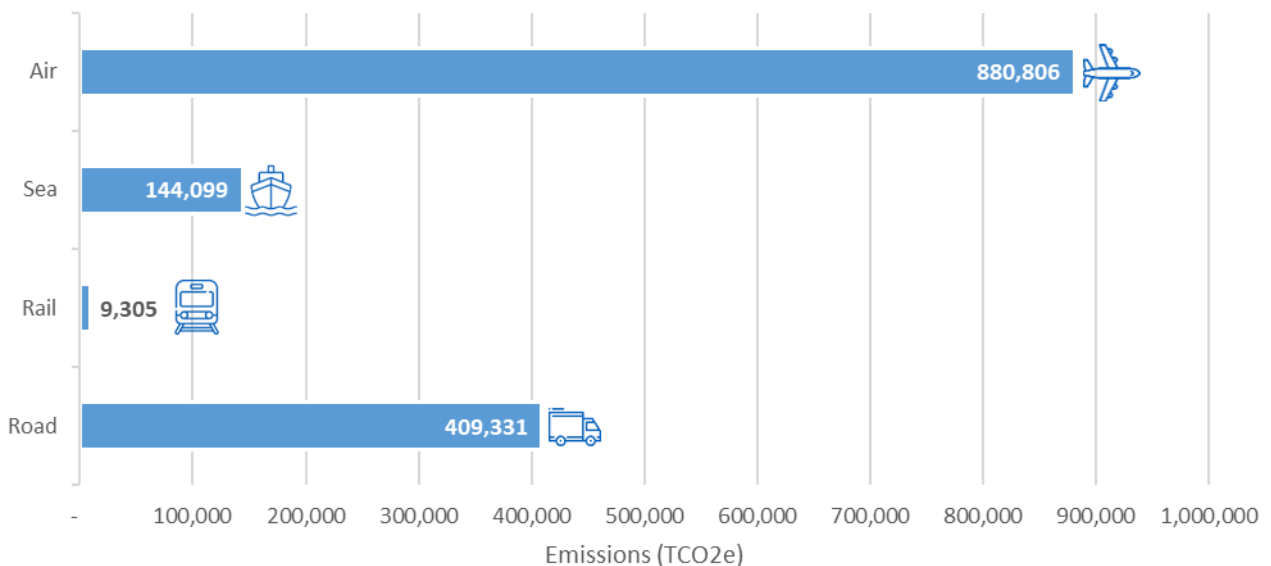
● Category 1 20.35%	● Category 2 1.13%
● Category 3 72.59%	● Category 4 5.94%
● Category 5 0.00%	● Category 6 0.00%

Category 1 Gas Breakdown

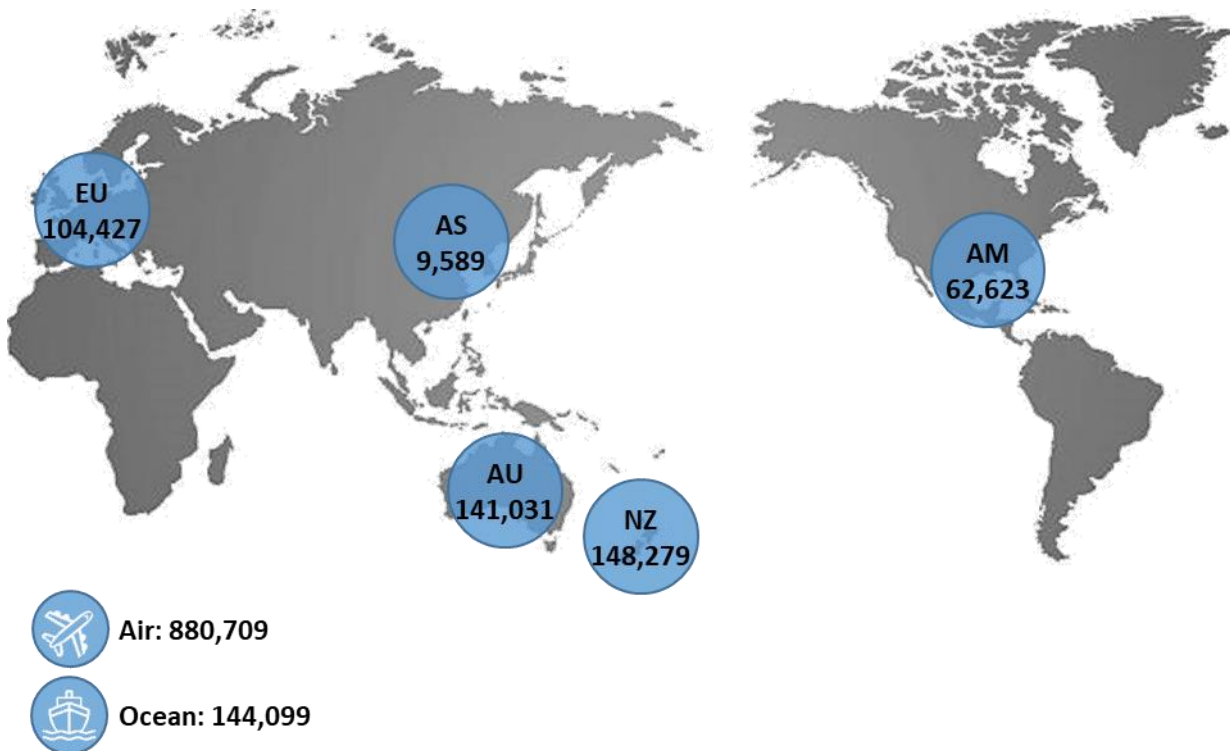


● Carbon Dioxide CO2 98.46%	● Methane CH4 0.18%
● Nitrous Oxide N2O 1.30%	● Hydrofluorocarbon HFC 0.06%

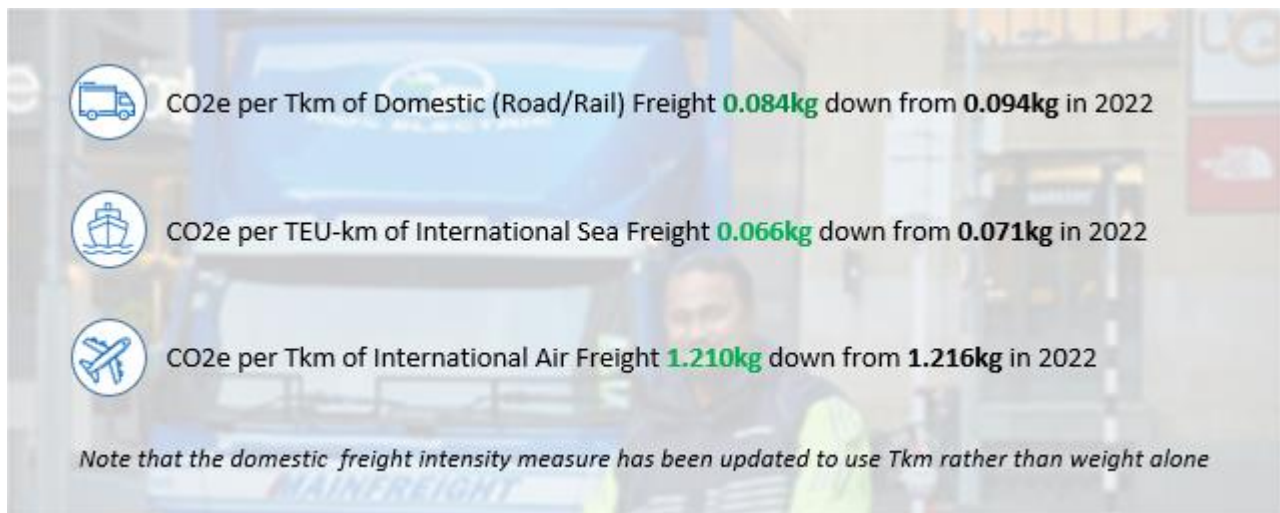
Freight Mode



5.2 Emissions by Region (Tonnes CO2e)



5.3 Emissions Intensity Measures



5.5 Freight Emissions by Mode (Year on Year)

Emissions Source	2024FY Tonnes CO2e	2022CY Tonnes CO2e
Road	409,331	461,391
Rail	9,305	10,233
Sea	144,099	163,960
Air	880,806	818,980
Total Freight Emissions	1,443,541	1,454,564
<i>Direct Operational Emissions</i>	<i>47,215</i>	<i>42,063</i>
Total Emissions	1,490,756	1,496,627
<i>Direct Operational Emissions % of Total</i>	<i>3.17%</i>	<i>2.81%</i>

5.6 Performance Measures, Targets and Benchmarks

Performance against fixed emissions targets is not currently practical to determine especially given Mainfreight's rate of growth. We do however aim to continuously reduce the emissions intensity of our activities year on year and will assess the relevance of new measures and targets in each reporting period.

APPENDICES

Appendix 1 – Bridging Inventory

Consolidated Statement of Greenhouse Gas Emissions: January to March 2023

EMISSIONS		Notes	CO2e TOTAL (Tonnes)	Carbon Dioxide (CO2)	Methane Non/Fossil Origin (CH4)	Nitrous Oxide (N2O)	Hydrofluoro- carbons (HFCs)
		1	GWP	1	27/29.8	273	
1	Category 1: Direct GHG emissions and removals in tonnes CO2e		58,184.76	57,393.75	109.22	681.79	
	Direct emissions from stationary combustion						
	Direct emissions from mobile combustion		58,184.76	57,393.75	109.22	681.79	
	Direct process and removals from industrial processes						
	Direct fugitive emissions from the release of GHGs in anthropogenic systems		-				-
	Direct emissions and removals from land use and forest change						
	Direct emissions in tonnes of CO2 from biomass	2	0.74	0.74			
	Indirect emissions in tonnes CO2e		299,885.76				
2	Category 2: Indirect GHG emissions from imported energy		4,665.16				
	Indirect emissions from imported electricity		4,665.16				
	Indirect emissions from imported energy	NS					
3	Category 3. Indirect GHG Emissions from Transportation		275,424.79				
	Emissions from upstream transportation and distribution of goods	NS					
	Emissions from downstream transportation and distribution of goods		273,685.82				
	Emissions from employee commuting	NS					
	Emissions from client and visitor transport	NS					
	Emissions from business travels		1,738.97				
4	Category 4. Indirect GHG emissions associated with the use of products by the organisation		19,795.81				
	Emissions from purchased goods and services	3	15,835.91				
	Emissions from capital goods	NS					
	Emissions from the disposal of solid and liquid waste		3,959.90				
	Emissions from the use of assets	NS					
	Emissions from other services not described above						
5	Category 5. Indirect GHG emissions associated with the use of products from the organisation						
	Emissions or removals from the usage of product	NS					
	Emissions from downstream leased assets	NS					
	Emissions from end of life stage of the product	NS					
	Emissions from investments	NS					
6	Category 6. Other indirect GHG emissions sources	NS					
	TOTAL EMISSIONS CATEGORIES 1 - 6	4	358,071.26				
REMOVALS		5					
	Direct removals in tonnes CO2e						
	Emissions Liabilities	6					
	Total Storage as of year end in tonnes CO2e		8,944.35				
Other Related Information							
	Performance tracking (emissions and removals by metric)		Greenhouse Gas Emissions Inventory Report				5
	Base year GHG emissions, removals and stocks; and adjustments to base year		Greenhouse Gas Emissions Inventory Report				4.6
	Disclosure of most significant sources and sinks		Greenhouse Gas Emissions Inventory Report				3.3
	Emissions Liabilities		Greenhouse Gas Emissions Inventory Report				4.3
	Significancy criteria		Greenhouse Gas Emissions Inventory Report				3.2
	Uncertainty assessment		Greenhouse Gas Emissions Inventory Report				4.5

[NS] Non significant

Notes to Consolidated Statement of Greenhouse Gas Emissions: January to March 2023

1. *Direct and indirect emissions have been prepared in accordance with the recommendations of Annex B. Gas types CO₂, CH₄, N₂O and HFCs have been included as those relevant to direct emissions.*
2. *Biomass emissions relate to the use of biofuels, while not significant in scale they are an area of interest and as such are included here. As per the ISO 14064-1: 2018 Standard the CO₂ emissions are recorded against biomass whereas the other gases (CH₄, N₂O etc are grouped within Category 1).*
3. *This includes electricity transmission and distribution losses. WTT (Well To Tank) emissions have also been included as emissions from purchased goods and services.*
4. *This total differs slightly from the Independent Assurance Statement below. This is due to rounding within Toitū Envirocare's internal audit documents and represents less than 0.001% of total emissions.*
5. *This document does not provide any recommendations or requirements for removal.*
6. *Emissions liabilities are denoted here but not included in the emissions total. For further details see section 4.2.*

Appendix 2 – ISO 14064-1:2018 Reporting Index

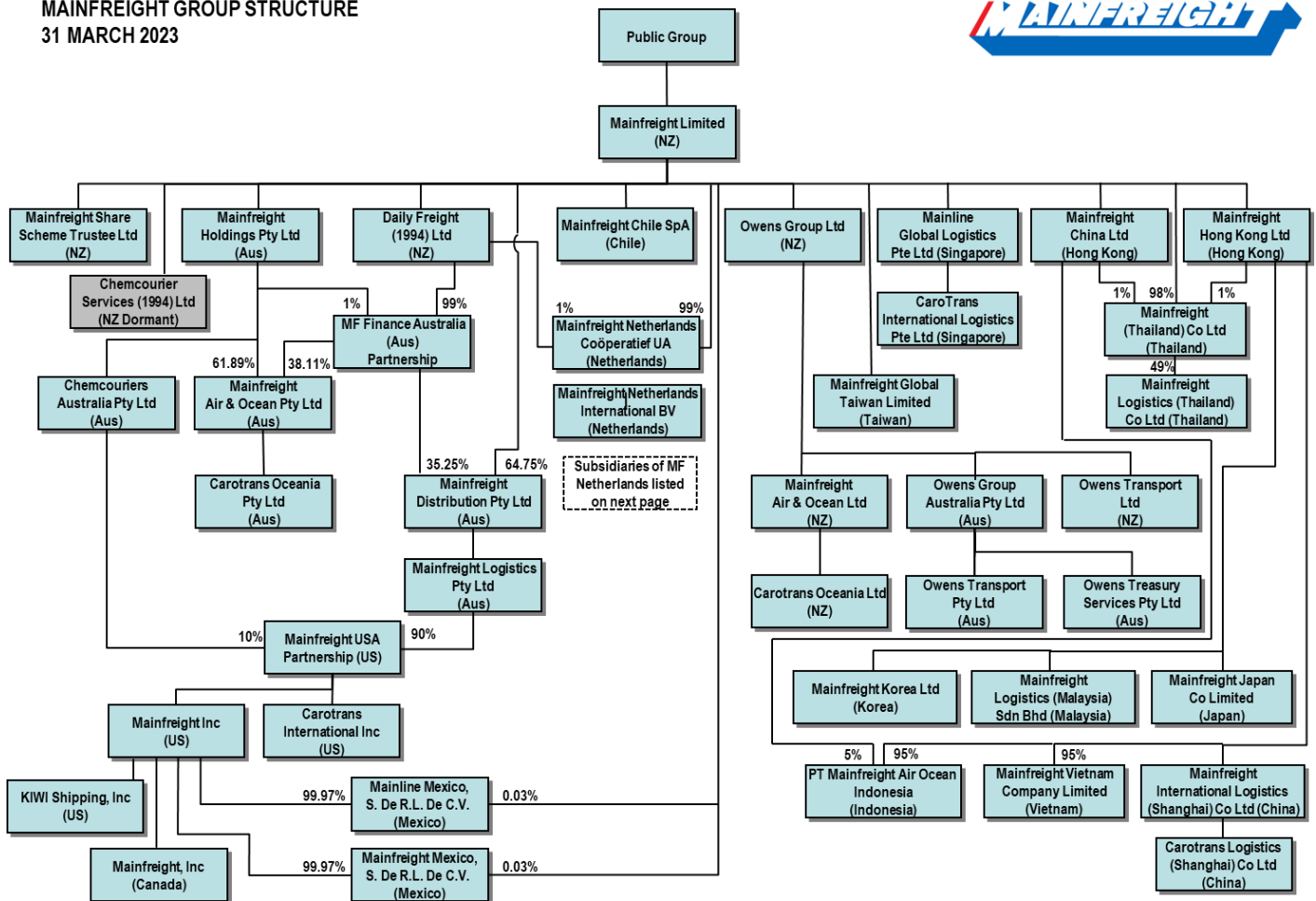
ISO Reporting	Section in this Report
9.3.1 (a)	1.3
9.3.1 (b)	1.4
9.3.1 (c)	1.6
9.3.1 (d)	2
9.3.1 (e)	3
9.3.1 (f)	4.1
9.3.1 (g)	4.1
9.3.1 (h)	4.6
9.3.1 (i)	3.3
9.3.1 (j)	4.1
9.3.1 (k)	4.5
9.3.1 (l)	4.5
9.3.1 (m)	4.2
9.3.1 (n)	4.2
9.3.1 (o)	4.2
9.3.1 (p)	4.4
9.3.1 (q)	4.4
9.3.1 (r)	1.7
9.3.1 (s)	1.7
9.3.1 (t)	4.2

ISO Reporting	Section in this Report
9.3.2 (a)	1.3
9.3.2 (b)	4.6
9.3.2 (c)	4.6
9.3.2 (d)	NA
9.3.2 (e)	4.6
9.3.2 (f)	4.1
9.3.2 (g)	5.3
9.3.2 (h)	5.5
9.3.2 (i)	4.3
9.3.2 (j)	4.6
9.3.2 (k)	4.6

ISO Reporting	Section in this Report
9.3.3	NA

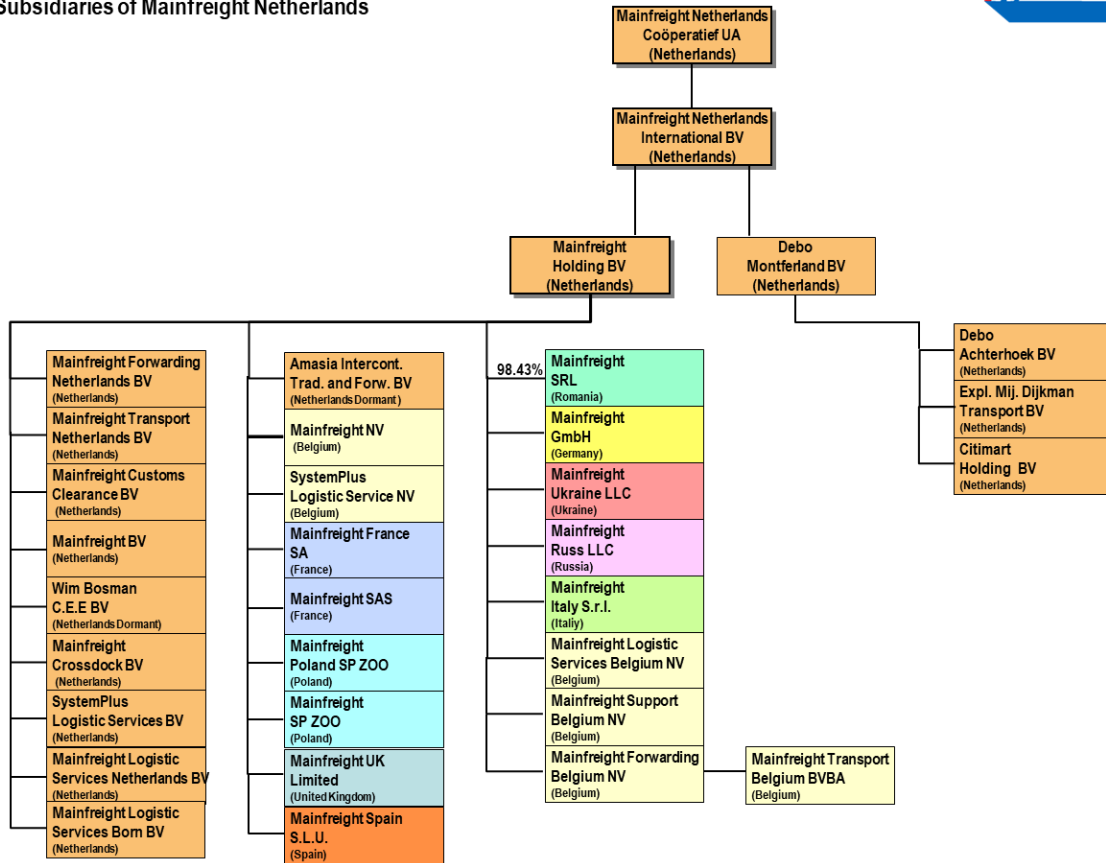
Appendix 3 – Mainfreight Group Structure

MAINFREIGHT GROUP STRUCTURE
31 MARCH 2023



All subsidiaries 100% ownership except where otherwise indicated

MAINFREIGHT GROUP STRUCTURE
Subsidiaries of Mainfreight Netherlands



INDEPENDENT ASSURANCE STATEMENT



INDEPENDENT AUDIT OPINION Toitū Verification

TO THE INTENDED USERS

Organisation subject to audit: Mainfreight Limited

Audit Criteria: ISO 14064-1:2018
ISO 14064-3:2019
Audit & Certification Technical Requirements 3.0

Responsible Party: Mainfreight Limited

Intended users: Mainfreight managers, team, customers, investors and all other stakeholders

Registered address: 2 Railway Lane, Otahuhu, Auckland, 1741, New Zealand

Inventory period: Cross Over Year: 01/01/2023 - 31/03/2023
Current Year: 01/04/2023 - 31/03/2024

Inventory report: 2024FY GHG Emissions Inventory Report V0.4

We have reviewed the greenhouse gas emissions inventory report ("the inventory report") for the above named Responsible Party for the stated inventory period.

RESPONSIBLE PARTY'S RESPONSIBILITIES

The Management of the Responsible Party is responsible for the preparation of the GHG statement in accordance with ISO 14064-1:2018. This responsibility includes the design, implementation and maintenance of internal controls relevant to the preparation of a GHG statement that is free from material misstatement.

VERIFIERS' RESPONSIBILITIES

Our responsibility as verifiers is to express a verification opinion to the agreed level of assurance on the GHG statement, based on the evidence we have obtained and in accordance with the audit criteria. We conducted our verification engagement as agreed in the audit letter, which define the scope, objectives, criteria and level of assurance of the verification.

The International Standard ISO 14064-3:2019 requires that we comply with ethical requirements and plan and perform the verification to obtain the agreed level of assurance that the GHG emissions, removals and storage in the GHG statement are free from material misstatement.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit carried out in accordance with the ISO 14064-3:2019 Standards will always detect a material misstatement when it exists. The procedures performed on a limited level of assurance vary in nature and timing from, and are less in extent compared to reasonable assurance, which is a high level of assurance. The procedures performed on a limited level of assurance vary in nature and timing from, and are less in extent compared to reasonable assurance, which is a high level of assurance. Misstatements are differences or omissions of amounts or disclosures, and can arise from fraud or error. Misstatements are considered material if, individually or in the aggregate, they could reasonably be expected to influence the decisions of readers, taken on the basis of the information we audited.

GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

BASIS OF VERIFICATION OPINION

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

VERIFICATION

We have undertaken a verification engagement relating to the Greenhouse Gas Emissions Inventory Report (the 'Inventory Report')/Emissions Inventory and Management Report of the organisation listed at the top of this statement and described in the emissions inventory report for the period stated above.

The Inventory Report provides information about the greenhouse gas emissions of the organisation for the defined measurement period and is based on historical information. This information is stated in accordance with the requirements of International Standard ISO 14064-1 Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals (ISO 14064-1:2018).

VERIFICATION STRATEGY

Our verification strategy used a combined data and controls testing approach. Evidence-gathering procedures included but were not limited to:

- activities to inspect the completeness of the inventory;
- interviews of site personnel to confirm operational behaviour and standard operating procedures;
- re-perform access controls to onsite records;
- sampling and/or reconciliation of fuel and freight records to confirm accuracy of source data into calculations;
- recalculation, retracing/sense checking of remaining emissions;

The data examined during the verification were historical in nature.

QUALIFICATIONS TO VERIFICATION OPINION

The following qualifications have been raised in relation to the verification opinion:

The opinion is unmodified.

VERIFICATION LEVEL OF ASSURANCE

January to March 2023	tCO ₂ e Location based	Level of Assurance
Direct Emissions:		
Category 1	58,184.78	Reasonable
Indirect emissions from imported energy:		
Category 2	4,665.16	Reasonable
Indirect emissions from transportation		
Category 3	275,424.79	Reasonable
Indirect emissions from products used by organisation:		
Category 4	19,795.82	Reasonable
Total gross emissions	358,070.55	

April 2023 to March 2024	tCO ₂ e Location based	Level of Assurance
Direct Emissions:		
Category 1	303,308.67	Reasonable
Indirect emissions from imported energy:		
Category 2	16,798.11	Reasonable
Reasonable		
Category 3	1,082,068.22	Reasonable
Indirect emissions from products used by organisation:		
Category 4	88,381.16	Reasonable
Total gross emissions	1,490,756.15	

RESPONSIBLE PARTY'S GREENHOUSE GAS ASSERTION (CERTIFICATION CLAIM)

Mainfreight Limited has measured its greenhouse gas emissions in accordance with ISO 14064-1:2018 in respect of the operational emissions of its organisation.

VERIFICATION CONCLUSION

We have obtained all the information and explanations we have required. In our opinion, the emissions, removals and storage defined in the inventory report, in all material respects:

- comply with ISO 14064-1:2018 ; and
- provide a true and fair view of the emissions inventory of the Responsible Party for the stated inventory period.

ADDITIONAL INFORMATION RELEVANT TO INTENDED USERS



Without qualifying our opinion expressed above, we wish to draw the attention of the intended users to the following :

The disclosures required by the Aotearoa New Zealand Climate Standards 1-3 were not included in the scope of the Toitū audit. We therefore did not assess consistency between these disclosures and the Greenhouse Gas inventory report which is the subject of this report. We do not express an opinion on the accuracy and completeness of these disclosures.

OTHER INFORMATION

The responsible party is responsible for the provision of Other Information to meet Programme requirements. The Other Information may include climate related disclosures around Governance, Strategy and Risk management, emissions management, reduction plan and purchase of carbon credits, but does not include the information we verified, and our auditor's opinion thereon.

Our opinion on the information we verified does not cover the Other Information and we do not express any form of audit opinion or assurance conclusion thereon. Our responsibility is to read and review the Other Information and consider it in terms of the programme requirements. In doing so, we consider whether the Other Information is materially inconsistent with the information we verified or our knowledge obtained during the verification.

Verified by:		Authorised by:	
Name:	Pieter Franssen	Name:	Billy Ziemann
Position:	Verifier, Toitū Envirocare	Position:	Certifier, Toitū Envirocare
Signature:		Signature:	
Date verification audit:	22-23 April 2024	Date:	16 May 2024
Date opinion expressed:	14 May 2024		