CUNDALL

# GHG Inventory Report

## Basis of Preparation, FY2023-24

## Christchurch International Airport Limited

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## Document revision history

| Revision ref | Issue date | Purpose of issue / description of revision |
|---|---|---|
| Draft A | 02 August 2024 | Initial draft |
| Draft B | 30 August 2024 | Revised draft |
| Draft C | 02 September 2024 | Revised draft, updated flight emission calculations and added LPG for fire training purposes |
| Draft D | 04 September 2024 | Revised draft, updated electricity consumption and corresponding GHG emissions estimates |
| Draft E | 04 September 2024 | Revised draft, consolidation of accommodation GHG emissions estimates and updated construction GHG emissions estimates |
| Draft F | 05 September 2024 | Revised draft, updated categorisation of emission sources under scope 3, category 2 |
| - | 18 September 2024 | Final Issue |
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## Document validation (latest issue)

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# Executive summary

This GHG inventory report represents the comprehensive greenhouse gas inventory for the fiscal year 2023- 24 (FY24). In line with the Airport Carbon Accreditation (ACA) requisites, Christchurch International Airport Limited (CIAL) is required to provide a detailed GHG inventory encompassing the airport's scope 1, 2, and 3 emissions for FY24 (see Table 1).

The Airport Carbon Accreditation program recommends that all relevant data and information for establishing the GHG inventory be consolidated into a GHG inventory report. This document serves as that GHG inventory report. This report details the emission sources included in the GHG inventory, corresponding activity data, methodologies, assumptions, limitations and emission estimates, and organisational and operational boundaries.

Table 1: GHG emissions by GHG Protocol scope and category in tonnes $CO_2$-e in FY24

| Emission source | Tonnes $CO_2$-e (location-based) | Tonnes $CO_2$-e (market-based) |
|---|---|---|
| Scope 1: Direct GHG emissions | 280 | 280 |
| Scope 2: Indirect GHG emissions | 1,042 | 0 |
| Scope 3, category 1, purchased goods and services | 3,172 | 3,172 |
| Scope 3, category 2, capital goods | 4,295 | 4,295 |
| Scope 3, category 3, fuel- and energy-related activities | 90 | 90 |
| Scope 3, category 5, waste generated in operations | 283 | 283 |
| Scope 3, category 6, business travel | 393 | 393 |
| Scope 3, category 7, employee commuting | 86 | 86 |
| Scope 3, category 11, use of sold products | 798,459 | 798,459 |
| Scope 3, category 13, downstream leased assets | 971 | 971 |
| **TOTAL** | **809,084** | **808,042** |

# Contents

# 1.0

# Purpose of this document

# 1.0 Purpose of this document

Cundall has been engaged by Christchurch International Airport Limited (CIAL) to prepare this greenhouse gas (GHG) inventory report (GHG inventory) for FY24 (see Table 2) to support CIAL to maintain their current Airport Carbon Accreditation at Level 5.

The ACA program is a global carbon management certification program for airports. It independently assesses and recognises the efforts of airports to measure, manage and reduce their GHG emissions through 7 levels of certification: 'Mapping' (Level 1), 'Reduction' (Level 2), 'Optimisation' (Level 3), 'Neutrality' (Level 3+), 'Transformation' (Level 4), 'Transition' (Level 4+), and Achievement (Level 5). CIAL is required to submit a GHG inventory annually of the airport's scope 1, 2 and 3 GHG emissions.

Additional requirements at Level 5 include:

- the formulation of policy commitment to maintain net zero for scope 1 and 2 $CO_2$-e emissions,
- an application that the airport must have already achieved reductions greater than 90% across Scope 1 and Scope 2, a commitment to net zero in scope 1 & 2, and to bolster sector commitments and/or ISO net zero in scope 3 by 2050,
- a GHG inventory, updated annually to demonstrate that net zero is maintained,
- the development of a carbon management plan which sets out the net zero trajectory and the measures required to achieve the target, and
- the development of a stakeholder partnership plan which details how the airport intends to bolster sector commitments to achieve net zero in scope 3.

This GHG inventory has been prepared in accordance with the requirements set out under the GHG Protocol's Corporate Standard and Corporate Value Chain (Scope 3) Standard, as well as the requirements set out under the ACA for Level 5 accreditation.

Table 2: GHG emissions by GHG Protocol scope and category in tonnes $CO_2$-e in FY24

| Emission source | Tonnes $CO_2$-e (location-based) | Tonnes $CO_2$-e (market-based) |
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# 2.0

# Description of Christchurch International Airport

# 2.0 Description of Christchurch International Airport

Christchurch Airport is located 10 kilometres northwest of Christchurch city centre, on the western city development edge and is a critical piece of significant national and regional infrastructure. CIAL is responsible for Christchurch Airport's efficient and safe operation and aims to provide the airport's diversity of users with modern, appropriate and competitive facilities and services. Ownership of CIAL is shared 75% by Christchurch City Holdings Limited and 25% by the New Zealand Government.

As the international gateway for Christchurch and the South Island, Christchurch Airport is a major hub and the busiest and most strategic air connection for the South Island to the world's trade and tourism markets. The airport is New Zealand's second-largest airport, with 12 partner airlines coming from 25 destinations. It provides a significant contribution to both the Canterbury region and the South Island, with the total airport operation employing more than 6,500 employees across a diverse range of companies.

Total passenger numbers in FY24 were 6.25 million, compared to 5.69 million in the prior year. Compared to pre-Covid levels, full year passenger numbers in FY24 were 97% for domestic and 76% for international.

# 3.0

# Reporting requirements

# 3.0 Reporting requirements

CIAL joined the ACA program at Level 2 in 2018, upgraded to Level 4 in 2020, and upgraded again to Level 5 in 2023. The ACA requires that emissions are reported in line with the GHG Protocol and that airports identify where they have direct control over emissions, such as scope 1 emissions from sources owned and/or controlled by the airport (e.g., emissions from the combustion of fuels in owned/controlled generators and vehicles), and scope 2 emissions resulting from the generation of purchased electricity consumed by the airport. Additionally, airports must identify and report indirect emissions which are the consequence of the activities at the airport but occur from sources not owned or controlled by the airport, which fall under scope 3. These other indirect emissions include those from aircraft movements, tenant/contractor ground support equipment, waste to landfill, ground access, business travel, staff commute, and similar activities.

As a requirement for accreditation at Level 5, CIAL needs to submit an annual GHG inventory of the airport's scope 1 and 2 emissions, as well as relevant scope 3 emissions. The ACA program recommends that all relevant data and information for establishing the GHG inventory be consolidated into a GHG inventory report. This document serves as that GHG inventory report. This report details the emission sources included in the GHG inventory, corresponding activity data, methodologies, assumptions, limitations and emission estimates, and organisational and operational boundaries.

A requirement of Level 5 accreditation is that the airport has achieved 90% or greater emissions reductions across scope 1 and scope 2 and that is maintained above 90% reductions against their baseline year (2015).

# 4.0

# Methodology

# 4.0 Methodology

## 4.1 GHG accounting principles

In estimating its GHG emissions, CIAL is guided by GHG accounting principles to monitor, report, and reduce its environmental impacts. These principles foster transparency and ensure data is reliable, complete, consistent, and accurate.

Key principles:

- Relevance:
  - Information should serve the decision-making needs of users.
  - Reflects GHG emissions and significant influences.
  - Considerations: organization's size, sector, GHG emissions level, stakeholder requirements.
- Materiality:
  - Pertains to the significance of data to users of the information.
  - Encompasses the quantity and quality of GHG emissions.
  - Ensure all significant GHG sources are reported, and no material information is omitted.
- Significance:
  - Refers to the climate impact of an organization's GHG emissions.
  - Significant emissions should be measured, managed, and reduced.
  - Considerations: scale of GHG emissions, stakeholder influence, other factors.
- De Minimis:
  - Acknowledges minor emissions sources that may be impractical to measure with high precision.
  - Allows for estimation or exclusion of minor emissions from GHG reporting.
  - Should not lead to significant underestimation of total GHG emissions.

These principles are interrelated and should collectively ensure robust GHG reporting, accuracy and utility for decision-making.

## 4.2 Standards and guidelines

- The requirements set out in the ACA Application Manual, Issue 14, December 2023,
- The New Zealand Ministry for the Environment's Measuring Emissions: A Guide for Organisations, MfE Guide 2024 (Detailed Guide 2024),
- The relevant GHG Protocol standards and guidance, specifically the
  - Corporate Accounting and Reporting Standard (revised edition),
  - Corporate Value Chain (scope 3) Accounting and Reporting Standard,
  - Technical Guidance for Calculating Scope 3 Emissions (version 1.0), and
  - Scope 2 Guidance.
- ISO 14064-3:2019
  - Specification with guidance for the verification and validation of greenhouse gas statements
- The guidance and recommendations set out under the
  - Airports International Council's Guidance Manual: Airport Greenhouse Gas Emissions Management, and
  - Airport Cooperative Research Program's Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories.

## 4.3 Emission factors

In establishing the GHG inventory, Cundall used emission factors and calculation methodologies available in:

- The NZ Ministry for the Environment's Detailed Guide 2024,
- The Airport Council International's Airport Carbon and Emissions Reporting Tool (ACERT v7.2338),
- The ICAO CORSIA $CO_2$ Estimation and Reporting Tool,
- Australian National Greenhouse Accounts Factors 2023,
- The expenditure-based emission factors from the Australian Climate Active Carbon Neutral initiative Activity Calculator v8.1,
- The e-tool software for estimating up-front embodied emissions (note: this assessment was conducted by Thinkstep ANZ, not conducted by Cundall), and
- The UK DEFRA 2024.

## 4.4 Method for calculating emissions

Unless otherwise stated, the method for calculating GHG emissions associated with fuel and electricity consumption is as follows:

- Petrol consumption: Amount of the liquid fuel delivered for the facility during the year as evidenced by invoices issued by the vendor of the fuel, multiplied by the corresponding emissions factor
- Diesel oil consumption: Amount of the liquid fuel delivered for the facility during the year as evidenced by invoices issued by the vendor of the fuel, multiplied by the corresponding emissions factor;
- Liquefied petroleum gas consumption: Amount of the liquid fuel delivered for the facility during the year as evidenced by invoices issued by the vendor of the fuel, multiplied by the corresponding emissions factor;
- Electricity consumption: Amount of electricity consumed based on supplier invoices multiplied by the corresponding emissions factor;
- Refrigerant use: Applied annual default leakage rate resulting from operations and applied Global Warming Potential.
- Purchased goods and services: NZD expenditure on goods and services, multiplied by the corresponding emissions factor; and
- Capital goods: For building structures, e-tool report produced by Thinkstep ANZ on up-front embodied carbon. For sealed surfaces, a list of materials provided by the contractor was used to estimate emissions. For vehicles, NZD expenditure on goods and services, multiplied by the corresponding emissions factor.

## 4.5 Rounding of amounts

If the amount for tonnes $CO_2$-e worked out under a GHG inventory is not a whole number, the number is rounded up to the next whole number if the number at the first decimal place equals or exceeds 5 and rounded down to the next whole number if the number at the first decimal place is less than 5.

# 5.0

# Organisational boundary and operational control approach

# 5.0 Organisational boundary and operational control approach

The organisational boundary determines which parts of CIAL are included in the GHG inventory. In the context of airport operations, determining greatest authority to introduce operating, health and safety, and environmental policies can be complex. They may be dependent on the contractual relationship between various parties. In some circumstances, the greatest authority will rest with CIAL as the corporation with day-to-day on-site managerial responsibility. This, however, must be balanced against the ability to introduce operating and environmental policies, which can sometimes rest with the tenant.

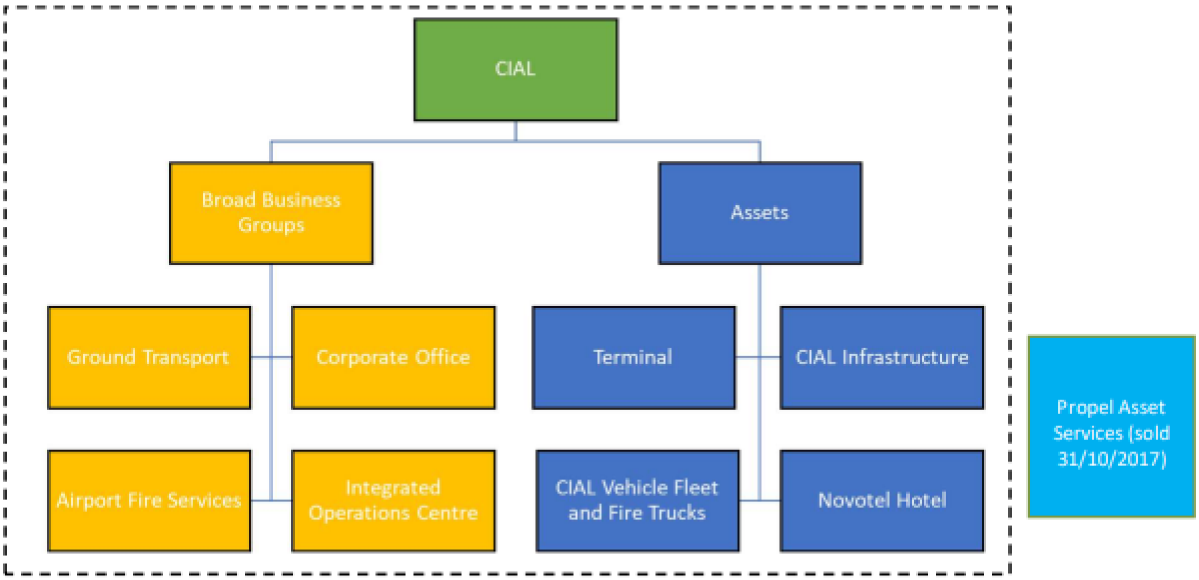


Figure 1: Organisational boundary

CIAL has adopted the following position:

- Where tenants are separately metered and billed by the electricity or gas provider or sub-metered within the airport and have the ability to control their own energy use, these are treated as facilities outside CIAL's operational control;
- Where CIAL purchases electricity or gas from a provider and on-sells it to sub-metered tenants who have the ability to control their own energy use, the associated emissions are treated as being outside CIAL's operational control;
- Where sub-metered leased space is/becomes vacant, CIAL's assumes operational control until such time that space is leased by a tenant; and
- Where CIAL on-sell electricity but do not sub-meter electricity or gas, the associated emissions are treated as being within CIAL's operational control.

# 6.0

# Operational boundary

# 6.0 Operational boundary

The operational boundary determines which emission sources will be quantified. Participation in the ACA program at Level 5 requires that all scope 1 (direct), scope 2 (indirect), and scope 3 (other indirect) emissions be reported.

## 6.1 Greenhouse gases

Emissions from carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and specified kinds of hydrofluorocarbons and (HFCs) are included in this GHG inventory. Emissions are measured in tonnes of carbon dioxide equivalent (t $CO_2$-e). The carbon dioxide equivalent ($CO_2$-e) allows the different greenhouse gases to be compared on a like-for-like basis relative to one unit of $CO_2$. $CO_2$-e is calculated by multiplying the emissions of each of the four GHGs covered in this report by its 100-year global warming potential (GWP) specified in the IPCC's Fourth Assessment Report.

## 6.2 Definition of scopes

The ACA program uses the GHG Protocol's operational boundary definitions for describing direct and indirect emissions. As such, scope 1, scope 2 and scope 3 are defined as per the GHG Protocol and the ACA Application Manual, Issue 14, page 25 (see Figure 2 for an overview of emission sources as per the ACA program):

Scope 1: Direct GHG emissions that occur from sources that are owned and/or controlled by the airport, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.

Scope 2: Indirect GHG emissions that occur from the generation of purchased electricity, steam, heat or cooling consumed by the airport. Scope 2 emissions physically occur at the facility where purchased electricity is generated.

Scope 3: All other indirect emissions in the value chain of the airport operator that occur from sources not owned and/or controlled by the company (e.g. purchased goods and services, aircraft movements, vehicles and equipment operated by third parties, off-site waste management, etc.). Such sources can be located inside or outside the airport premises (geographical boundary). They include upstream emissions (Categories 1-8: indirect emissions related to purchased or acquired goods and services, if applicable) and downstream emissions (Categories 9-15: indirect emissions related to sold products and services, if applicable). The range of scope 3 emission sources has been expanded over time to respond to new evidence and reach compliance with various other international standards and recommendations (Figure 6).

For third-party emissions, this includes only their scope 1 and scope 2 emissions, not their scope 3 emissions ( "scope 3 of scope 3"). While transmission and distribution losses, as well as emissions associated with the extraction, production, and distribution of fuels, have been included for all energy consumption, other "scope 3 of scope 3" sources have not been included in this report.

Figure 3 illustrates the emission sources considered within the ACA reporting framework. The inclusion of specific emission sources varies based on the accreditation level. For more detailed information on the included emission sources for this ACA Level 5-compliant GHG inventory, please refer to Section 6.4.


Figure 2: Emission sources at an airport

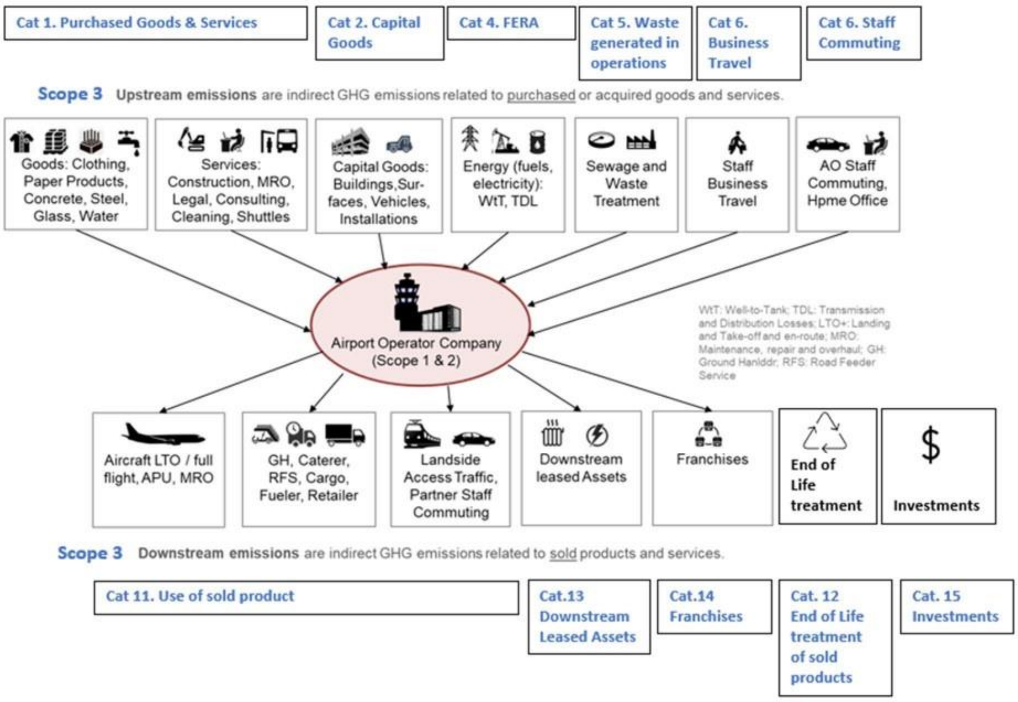


Figure 3: Up- and downstream scope 3 emissions

### 6.3 Data used for calculating GHG emissions and energy consumption

This GHG inventory is based on the best data available and emissions factors at time of compilation. The discussion of the individual emission sources includes references to the source documents and an outline of methodology and assumptions used in estimating emissions.

Data is aggregated by CIAL's accounting/finance and asset/sustainability teams.

Based on the data provided and methodologies applied, it is expected that the reported quantity of scope 1 and scope 2 GHG emissions is not significantly different to the true value.

CIAL respects tenants' legal rights to quiet enjoyment of tenancy and/or the need for information to remain commercial-in-confident, and therefore, cannot demand data. Instead, CIAL invites tenant and contractor participation in a voluntary data-sharing arrangement to estimate scope 3 GHG emissions where this information cannot be estimated using on-sold energy information.

This GHG inventory will be updated should more up-to-date or accurate methodologies and/or emission factors become available or if any significant errors (i.e. resulting in a difference in the reported GHG inventory of more than 5%) are identified.

### 6.4 GHG inventory categories (assumptions/limitations/justifications)

This report is based on calculations that use the classification of GHG emission sources as outlined in the GHG Protocol, including scope categorisation[1].

GHG emissions have been aggregated into the following categories:

- Scope 1: Direct GHG emissions from
  - Stationary energy combustion
  - Mobile energy combustion
  - Fire training
  - Fugitive emissions from leakage
  - De-icing
- Scope 2: Indirect GHG emissions
  - Grid-purchased electricity, CIAL
- Scope 3: Other indirect GHG emissions
  - Category 1: Purchased goods and services
    - Goods, cleaning, consumable products
    - Goods, de-icing (tenant)
    - Goods, maintenance, gardening
    - Goods, fertiliser
    - Goods, print & stationery
    - Goods, uniforms and protective clothing
    - Goods, water supply
    - Professional services, accounting, legal, and audit
    - Professional services, consulting fees
    - Professional services, ICT data, internet, and cloud services

[1] Table 16 in section 7 of this report provides a breakdown of GHG emissions. It includes sources of emissions, estimates of GHG emissions, and categorisations according to the GHG Protocol, to aid in reporting to the ACA administrator.

- Professional services, insurance
- Category 2: Capital goods
  - Building structures (embodied carbon)
  - Sealed surfaces
  - Operating surfaces, airside, road, parking
  - Vehicles
- Category 3: Fuel- and energy-related emissions not included in scope 1 or scope 2
  - Extraction, production, and distribution of fuels, diesel
  - Extraction, production, and distribution of fuels, LPG
  - Extraction, production, and distribution of fuels, petrol
  - Transmission and distribution losses, electricity
- Category 5: Waste generated in operations
  - Waste to landfill
  - Wastewater
- Category 6: Business travel
  - Accommodation, by country of travel
  - Air travel, by class of air travel and flight type (international or domestic)
- Category 7: Employee commuting
  - Working from home
  - Third party staff commute
- Category 11: Use of sold products
  - APU usage, large aircraft
  - APU usage, small-medium aircraft
  - Engine run-ups, aircraft with aviation gasoline
  - Engine run-ups, double-aisle aircraft with kerosene
  - Engine run-ups, single-aisle aircraft with kerosene
  - Full flight emissions, departing flights
  - Tenant/contractor vehicles
  - Ground access, busses and shuttles
  - Ground access, cars and taxis
- Category 13: Downstream leased assets
  - Stationary energy, on-sold electricity
  - Stationary energy, on-sold LPG
  - Transport energy, diesel

Achieving a complete GHG inventory can require using less accurate or complete indirect/scope 3-related data, affecting accuracy and completeness. It can be difficult to determine or verify the source and quality of indirect/scope 3 emissions data supplied by third parties, etc. This GHG inventory is considered to have achieved a sufficiently robust and balanced trade-off between tracking and reporting indirect/scope 3 GHG emissions.

### 6.4.1 Scope 1: Direct GHG emissions from stationary and transport energy consumption, including fire training

The GHG inventory accounts for direct GHG emissions from diesel and petrol consumption and fire training (LPG, wood).

- Fuels used for transport energy purposes produce slightly different methane and nitrous oxide emissions than if the same fuels were used for stationary energy purposes. Whether fuel is accounted for as fuel for stationary or transport purposes is based on whether fuels are used to move a vehicle.
- Petrol and diesel premium products have been accounted for using the default emission factors for petrol and diesel. The resulting difference is negligible and does not constitute a risk of material misstatement.
- It is noted that in the Detailed Guide 2024, emission factors for fuel consumption are provided at a higher level (i.e., kg $CO_2$-e/litre) than those for scope 3 travel emission factors (kg $CO_2$-e/km based on vehicle age, engine size and engine type of vehicle).
- LPG has been accounted for as stationary combustion of LPG for commercial use and fire fighting training.

  Fuel for vehicles that occasionally refuel at service stations off-site, though minimal and unlikely, has been classified as a de minimis emissions source. Such instances have been confirmed, but no data is available.

Table 3: Summary of method to estimate direct GHG emissions from stationary and transport energy consumption

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [fuel consumed (litres/kg)] x [fuel type emissions factor (per litre/kg)]<br>Total GHG emissions (t $CO_2$-e) = [fuel consumed (kg (LPG)/kg)] x [fuel type emissions factor (per kg (LPG)/kg)] |
| **Activity data source** | ▪ Scope 1 Diesel Sum FY24.xlsx<br>▪ Carbon Emissions Source Data.xlsx<br>▪ RE 2024 GHG Emissions Audit Data Gathering. AFS Fire Training Fire Training Ground resources.msg |
| **Activity data** | ▪ Fuels used by CIAL, fuel consumption under CIAL's operational control<br>▪ Total $CO_2$ in fire extinguishers |
| **Emissions factors** | Detailed Guide 2024, Tables 3 & 4 |

### 6.4.2 Scope 1: Direct GHG emissions from fugitive emissions

CIAL voluntarily accounts for fugitive emissions (losses) from refrigerants for commercial air conditioning. These losses typically arise from gradual leaks during normal operation, losses during service and maintenance, major equipment failures, or decommissioning. Losses considered in this GHG inventory are from gradual leaks during normal operation. The estimation of stock HCFCs, HFCs, and SF6 contained in any equipment would be based on the stated capacity of the equipment according to the manufacturer's nameplate. Losses considered in this GHG inventory are those from an estimated annual leakage rate (i.e., gradual leaks during normal operation).

Table 4: Summary of method to estimate GHG emissions from fugitive emissions

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [refrigerant(kg) x [GWP(kg)]/1,000*[leakage rate] |
| **Activity data source** | FW CIAL greenhouse gas sustainability.msg |
| **Activity data** | List of air-conditioning units under operational control of CIAL, refrigerant types, and refrigerant volumes |
| **GWP and leakage rates** | Detailed Guide 2024<br>Tables B1 & B2, IPCC/TEAP Special Report: Safeguarding the Ozone Layer and the Global Climate System |

#### 6.4.3 Scope 1: Direct GHG emissions from de-icing

GHG emission sources included are fire extinguishers used in fire training and de-icing under the operational control of CIAL. Activity data has been entered into the ACERT and the corresponding GHG emissions estimate transferred into the calculation spreadsheet.

Table 5: Summary of method to estimate GHG emissions from de-icing

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [product used (litre/kg)] x [emission factor (per litre/kg)] |
| **Activity data source** | RE: 2024 GHG Emissions Audit Data Gathering - Heads Up notice.msg |
| **Activity data** | Amount of de-icing chemicals used |
| **Emissions factors** | ACERT V7.2338 methodology |

#### 6.4.4 Scope 2: Indirect GHG emissions from grid-purchased electricity

GHG emissions estimates associated with grid-purchased electricity are based on total grid-electricity delivered to CIAL facilities as evidenced by meters and utility invoices minus electricity on-charged to tenants.

Emission sources include grid-purchased electricity for the passenger terminal, AFS/IOC, the Novotel, as well as miscellaneous smaller sources, and transmission and distribution losses. This also includes electricity used for water pumps (ICPs can be isolated).

Information on electricity purchased by tenants directly from a supplier was not available. CIAL respects tenants' rights to quiet enjoyment of tenancy and/or the need for information to remain commercial-in-confidence, and, therefore, cannot demand data. Instead, CIAL invites tenant and contractor participation in a voluntary data sharing arrangement to estimate scope 3 GHG emissions where this information cannot be estimated using on-sold energy information.

Table 6: Summary of method to estimate GHG emissions from imported energy

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [electricity consumed (kWh)] x [Electricity grid emissions factor (per kWh)] |
| **Activity data source** | New Approach FY24v1.xlsx |
| **Activity data** | ▪ Grid-purchased electricity by CIAL.<br>▪ Electricity on-charged to tenants. |
| **Emissions factors** | Detailed Guide 2024, Tables 9 & 10 |

The ACA program requires airports that operate in markets with access to contractual agreements to report scope GHG emissions using both the location-based and market-based approaches. The location-based approach uses the average emission factor specific to the grid on which the energy consumption occurs. In the case of CIAL, this is the New Zealand grid. As such, the scope 2 emission factor for purchased electricity is the same as the one in section 5.2 of the Detailed Guide 2024, see Table 7.

Table 7: Electricity purchased from the grid

| Emission source | Scope | Unit | Kg $CO_2$-e/unit |
|---|---|---|---|
| Purchased electricity (location-based) | 2 | kWh | 0.0729 |
| Purchased electricity (market-based)<br>▪ NZECS certificates<br>▪ NZECS certificates | <br>2<br>2 | <br>kWh<br>kWh | <br>0.000<br>0.000 |

| | | | |
|---|---|---|---|
| Transmission and distribution losses for electricity | 3 | kWh | 0.00533 |

The market-based method reflects emissions from electricity purchases that companies have purposefully chosen in form of contractual instruments, such as green power options, renewable energy certificates ('REC's), carbon neutral electricity options, direct energy supply contracts, supplier-specific emission factors, or other emission factors representing the untracked or unclaimed energy and emissions (residual mix).

#### 6.4.5 Scope 3, Category 1 & 2: Purchased goods and services and capital goods

CIAL accounts for GHG emissions associated with purchased goods and services. CIAL has previously used an input/output (I/O) approach. The IO methodology, also known as the expenditure-based approach, is widely used in GHG accounting. It is an economic model that describes the interdependencies between different branches of a national or regional economy.

As part of an ongoing commitment to improving the accuracy and transparency of emissions reporting, CIAL is transitioning from the traditional I/O methodology to a more precise activity data-based approach. The I/O method, while useful for providing broad estimates, has several limitations that can obscure the specific characteristics of the airport's operations. Notably, it relies on aggregated economic data, which can lead to inaccuracies, particularly in a complex environment like an airport where emissions sources are diverse and continuously evolving. Furthermore, the assumption that all activities within a sector are homogenous often fails to capture the variability required for precise emissions accounting. Another key limitation of the I/O methodology is the assumption of a linear relationship between costs and emissions, which may not always hold true, leading to potential inaccuracies in estimating the environmental impact.

In response to these limitations, CIAL is adopting an activity-based approach that allows for more accurate measurement of emissions related to purchased goods and services, capital goods, and construction activities. This shift enables the provision of emissions data that more accurately reflects the actual environmental impact, thereby addressing the shortcomings of the I/O methodology and aligning with industry best practices.

However, this transition is not without challenges. The implementation of new data collection systems, the integration of data from multiple sources across the airport, and the need for consistent and reliable data from partners will require concerted effort. These challenges are expected, but CIAL is committed to addressing them transparently and ensuring continuous improvement in reporting practices.

One example of this shift is the use of Life Cycle Assessments (LCAs) for construction and infrastructure projects. Unlike the I/O method, which provides broad estimates based on economic expenditure, LCAs offer a more detailed analysis of the environmental impacts associated with the entire lifecycle of construction materials—from extraction and manufacturing to transport, use, and disposal. This approach allows for a more precise understanding of the emissions generated by specific materials and processes, enabling more informed decisions aimed at reducing the carbon footprint of infrastructure projects.

In 2023, CIAL contracted Thinkstep ANZ to conduct a life-cycle assessment of their Spec 9 Campus Warehouse construction project. CIAL have advised this was the only building structures project conducted during the reporting year. GHG emissions for the category "Building Structures" was estimated using the A1-A5 (Upfront Carbon emissions) per unit area in the report. These emissions take into account the Product (A1-A3), Transport (A4) and Construction (A5) emissions of the project.

In line with the airport's ongoing transition from expenditure-based emissions reporting to a more supplier and material-specific approach, emissions estimates for the Syd Bradley Road Extensions were derived using the UK DEFRA 2024 conversion factors. These factors provide a standardised methodology for calculating emissions, ensuring consistency in reporting practices. The construction-related emission sources were broadly categorised, covering a wide range of material groups.

In some cases, certain sources could not be converted to tonnes due to insufficient information needed to accurately estimate their mass. For example, activities like dust control, general testing, or the installation of sediment measures involve processes or materials where direct weight-based conversion is not applicable, or where key details such as material density, thickness, or volume were not available. Additionally, some activities are not directly tied to material usage or may already be accounted for under other emission sources, such as energy consumption or equipment usage, which do not have a straightforward mass equivalent. Future reports will require a more nuanced and detailed analysis to accurately capture the specific materials used and their associated emissions.

The use of average densities and conversion factors in this analysis assumes homogeneity within material groups, which may lead to inaccuracies if density variations are not accounted for, particularly when considering product-specific differences or regional material variations. While simplified models and conversion factors were applied to provide quick, understandable estimates, these simplifications may overlook important factors such as supply chain emissions, regional energy mix differences, or variations in material-specific manufacturing processes.

A more nuanced and detailed analysis will be necessary in future reports to more accurately capture the specific materials used.

Table 8: Summary of method to estimate emissions from waste purchased goods and services and capital goods

| | |
|---|---|
| **Emissions calculation approach** | **Cleaning and other purchased goods and services:** Total GHG emissions (t $CO_2$-e) = [total expenditure on item ($)] x [emissions factor ($CO_2$-e/$)]<br>**De-icing (tenant):** Total GHG emissions (t $CO_2$-e) = [total mass of de-icing (kg)] x [emissions factor ($CO_2$-e/kg)]<br>**Water supply:** Total GHG emissions (t $CO_2$-e) = [total volume wastewater ($m^3$)] x [emissions factor ($CO_2$-e/ $m^3$)] |
| **Activity data source** | **Cleaning, consumable products:** FY24 4010 analysis.xlsx<br>**Fertiliser:** RE: CIAL GHG Inventory FY24 Fertiliser inputs VC 150824.msg<br>**Other purchased goods and services:** Draft 2024 P&L.xlsx<br>**De-icing (tenant):** Deicing_Records_Master_Spreadsheet.xlsx<br>**Water supply:** Updated_Avonhead FY24.xlsx and wairakei FY24.xlsx<br>**Building Structures:** Dakota Park - Spec 9 – LCA.pdf<br>**Sealed Surfaces:** Copy of 2022-159 Schedule of Quantities - Appendix 2 (Cundall workings).xlsx |
| **Activity data** | Expenditure on items<br>Embodied upfront carbon emissions for building structures (Spec 9 Project)<br>Quantities used in construction of sealed surfaces<br>kg in de-icing<br>$m^3$ in water |
| **Emissions factors** | Climate Active GHG emission factors for professional services, construction, and products<br>ACERT V7.2338 for de-icing<br>Detailed Guide 2024 for water supply<br>e-tool software (conducted by Thinkstep ANZ)<br>UK DEFRA 2024 |

### 6.4.6 Scope 3, Category 3: Fuel- and energy-related emissions not included in scope 1 or scope 2

***Transmission and distribution losses***

GHG emissions estimates associated with grid-purchased electricity on-charged are based on total grid-electricity delivered to CIAL facilities as evidenced by meters and utility invoices.

GHG emissions estimates associated with LPG consumption are based on LPG recovered from tenants.

Emission sources include grid-purchased electricity for the passenger terminal, AFS/IOC, the Novotel, as well as miscellaneous smaller sources, and transmission and distribution losses. This also includes electricity used for water pumps (ICPs can be isolated).

Emissions associated with the extraction, production, and distribution are based on all fuel consumption on campus. New Zealand does not publish such emission factors; CIAL uses the Australian emission factor as proxy. Data on electricity and fuels purchased by tenants directly from a supplier was not available. CIAL respects tenants' rights to quiet enjoyment of tenancy and/or the need for information to remain commercial-in-confidence, and, therefore, cannot demand data. Instead, CIAL invites tenant and contractor participation in a voluntary data sharing arrangement to estimate scope 3 GHG emissions where this information cannot be estimated using on-sold energy information.

Table 9: Summary of method to estimate transmission and distribution losses and EPD emissions

| | |
|---|---|
| **Emissions calculation approach** | ▪ Total T&D losses GHG emissions (t $CO_2$-e) = [electricity consumed (kWh)] x [Electricity T&D loss emissions factor (per kWh)]<br>▪ Total EPD GHG emissions (t $CO_2$-e) = [fuel consumed (GJ/kL)] x [EPD emissions factor (kg $CO_2$-e/GJ)] |
| **Activity data source** | New Approach FY24v1.xlsx |
| **Activity data** | ▪ For transmission and distribution losses, sum of all grid-purchased electricity.<br>▪ For extraction, production, and distribution of fuels, sum of all fuels |
| **Emissions factors** | Detailed Guide 2024, Table 12 and NGA Factors 2023 Tables 8 & 9 |

### 6.4.7 Scope 3, Category 5: Waste generated in operations

***Waste disposal to landfill***

Waste disposal to landfill does not include recycling or document management (which have been assigned a zero-emission factor). Organic waste is collected separately and turned into compost. Therefore,  waste to landfill volumes exclude materials sent to recycling and organics sent to the composting facility. CIAL waste is classified as commercial waste due to its origin from commercial activities, biosecurity concerns, volume, and regulatory framework.

Table 10: Summary of method to estimate emissions from waste disposal to landfill

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [total mass of waste (t))] x [emissions factor (t $CO_2$-e/t)] |
| **Activity data source** | FY24 Waste to landfill.xlsx |
| **Activity data** | Tonnes of waste picked up by contractor |
| **Emissions factors** | Detailed Guide 2024, Table 75 |

***Water and wastewater***

GHG emissions from water and wastewater treatment include activities as they relate to sourcing water, its treatment, transmission, and reticulation components of the water supply network.

Table 11: Summary of method to estimate GHG emissions from water and wastewater

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$e) = [Total volume of water consumption ($m^3$)] x [water supply and wastewater treatment emissions factor (t $CO_2$-e/$m^3$)] |
| **Activity data source** | Updated_Avonhead FY24.xlsx<br>wairakei FY24.xlsx |

| | |
|---|---|
| **Activity data** | Total litres of water supplied and sent to wastewater treatment plants. |
| **Emissions factors** | Detailed Guide 2024, Table 68 |

### 6.4.8 Scope 3, Category 6: Business travel

***Staff business travel – accommodation***

Hotel stay emissions are based on travel data provided by CIAL. The number of room nights (number of rooms booked, not number of guests) is then multiplied by a country-specific GHG emission factor.

Table 12: Summary of method to estimate GHG emissions from business travel - accommodation

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [Hotel night stays per country] x [Hotel stay emissions factor] |
| **Activity data source** | Carbon Emissions Source Data.xlsx |
| **Activity data** | Room nights in country |
| **Emissions factors** | Detailed Guide 2024, Table 45<br>Where emissions factors not available in Detailed Guide 2024, https://www.hotelfootprints.org/ |

***Staff business travel – Air travel***

CIAL uses its travel management system and city pair data to estimate the flight distance. 'City pairs' refers to the flight's origin and destination cities. After calculating the distance between city pairs, an emissions estimate per kilometre per passenger is applied, giving an approximate amount of GHG emissions per passenger for each kilometre of flight. An error was identified in the FY23 CIAL Basis of Preparation report where the radiative forcing effect multiplier was applied twice for staff business air travel. Emissions factors for the FY24 CIAL Basis of Preparation report already include the radiative forcing effects.

Table 13: Summary of method to estimate emissions from business air travel

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$e) = [distance flown (city pair)] x [emission factor (kg $CO_2$-e/pkm)] |
| **Activity data source** | Carbon Emissions Source Data.xlsx |
| **Activity data** | Distance flown by flight type (i.e. domestic, international, short-haul, long-haul, business, economy) |
| **Emissions factors** | Detailed Guide 2024, Tables 37 & 43 |

### 6.4.9 Scope 3, Category 7: Employee commuting

The data pertaining to staff and tenant staff commutes is gathered based on the information made available to CIAL. This includes details such as the modes of transportation used, the frequency of commutes, and the approximate distances travelled. Given the variations in individual commute patterns, this data is necessarily an estimate.

Table 14: Summary of method to estimate emissions from (tenant) staff commute

| | |
|---|---|
| **Emissions calculation approach** | ▪ Total GHG emissions (t $CO_2$e) = [total days working from home] x [emission factor (kg $CO_2$- e/day)] |
| **Activity data source** | ▪ Ground Access data FY24.xlsx<br>▪ RE: 2024 GHG Emissions Audit Data Gathering - GHG Inventory FY24 - staff numbers and staff working from home data |

| | |
|---|---|
| | ▪ RE GHG Inventory FY23 - staff numbers and staff working from home data.msg<br>▪ Staff Working from home Survey question Y23.xlsx |
| **Activity data** | Number of staff and tenant staff |
| **Emissions factors** | ACERT V7.2338<br>Detailed Guide 2024, Table 13 |

#### 6.4.10 Scope 3, Category 11: Use of Sold products

Due to the multifaceted nature of airport operations, CIAL opts to report on certain aircraft- and airport-specific emission sources in a distinct category, as allowed by the GHG Protocol Technical Guidance for Calculating Scope 3 Emissions. This categorisation aids in providing a more comprehensive and detailed understanding of the airport's total emissions.

Emission sources included in this distinct category are full flight emissions - covering the entire journey of flights departing from the airport, Auxiliary Power Unit (APU) usage - which are the systems that provide energy for functions other than propulsion, and engine run-up testing, which involves running the engines at high power levels on the ground for testing and maintenance purposes.

CIAL has updated its methodology for calculating full flight emissions to better align with the Airport Carbon Accreditation (ACA) requirements. Previously, the calculation included all flights both departing and arriving at the airport, taking 50% of the total emissions to account for the shared responsibility with the destination airports.

The revised methodology considers only the flights departing from the airport, adhering more closely to the ACA's expectations and providing a clearer accountability for emissions directly linked to CIAL's operations.

In addition, a 1.9 multiplier is now applied to the full flight emissions calculation. This factor is used to account for radiative forcing effects of aviation, such as contrails and cirrus cloud formation, which significantly amplify the total climate impact of the flight.

CIAL's full flight emissions are calculated based on the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) Central Emissions Estimation Tool (CERT). This tool is designed specifically for aviation and is recognised for its accuracy and comprehensive approach.

Moreover, emissions from APU usage and from engine run-up testing were estimated using the ACERT.

In addition, ground access emissions from buses and cars are also included, capturing the transportation emissions linked to the airport's operations but not directly controlled by CIAL. These considerations ensure a more extensive coverage of emissions resulting from CIAL's activities, enhancing the accuracy of the GHG inventory and effectiveness of reduction strategies.

Additional assumptions:

- Fixed-wing aircraft with a maximum take-off weight ('MTOW') over 5,700kg: Used the ICAO CORSIA CERT. Full-flight (departure only, from NZCH) method used for MTOW over 5,700kg, apportioned 75% of emissions for MTOW less than 5,700kg and helicopters.
- Fixed-wing aircraft MTOW < 5,700kg: Used specific fuel consumption rating for each engine (or similar engine), total engine horsepower, total engine run time (hours, calculated based on route and aircraft cruise speed), and average throttle setting across entire engine run (percentage) to estimate emissions.
- Helicopters: Methodology under development as CIAL does not collect helicopter movement data on a regular basis. As helicopters don't need to operate from an aerodrome, often the route data is incomplete, a flight time value of one hour is assumed. Also estimated is the average throttle setting of 75%.
- Electrified power supply (i.e., GPU usage) is included in scope 2 GHG emission estimate. APU usage assumes an average duration of APU operation before and after flights of 30 minutes for both small-medium and large aircraft. CIAL used the ACERT v6 to estimate this emission source. Average duration is entered under item 7.2 of the ACERT v6.

- An assumption was made that mode share for commuting for tenant staff was the same as mode share as for airport operator staff due to unavailability of specific tenant mode share data. The tenant staff, passenger, and visitor ground access fuel share for public buses and cars was estimated from https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf. CIAL use 100% electric shuttle buses.

Table 15: Summary of method to estimate indirect GHG emissions from stationary and transport energy consumption

| | |
|---|---|
| **Emissions calculation approach** | Total GHG emissions (t $CO_2$-e) = [fuel consumed (litres/kg)] x [emissions factor (t $CO_2$-e per litre/kg)] |
| **Activity data source** | ▪ Full Flight Emissions FY24 Departures Only.xlsx<br>▪ FY24 APU Emissions Summary.xlsx<br>▪ RE 2024 GHG Emissions Audit Data Gathering. ETMS Data.msg<br>▪ Ground Access data FY24.xlsx<br>▪ ACERT V7.2338.xlsx<br>▪ RE Christchurch Airport GHG inventory update. TENANT Numbers.msg<br>▪ Staff Working from home Survey question Y23.xlsx |
| **Activity data** | ▪ CIAL flight data<br>▪ Aircraft movements and type of aircraft<br>▪ Number of engine run-ups<br>▪ Flight segments, i.e. origin and destination airports |
| **Emissions factors** | ▪ ACERT V7.2338<br>▪ ICAO CORSIA CERT |

### 6.4.11 Scope 3, Category 13: Downstream leased assets

The "downstream leased assets" category under scope 3 emissions encompasses all tenant activities occurring within or on the assets they lease. Given the complex nature of airport operations, with a multitude of independent entities operating on the airport premises, this category is the most suitable for capturing the relevant emissions data.

In the case of CIAL, the specific emission sources considered under downstream leased assets include on-sold electricity and LPG used for stationary energy purposes, as well as diesel for transport purposes. Thus, this category captures emissions not only from the direct operation of the leased assets, but also from the energy used within these assets and the transportation associated with these leased activities.

The method to estimate corresponding emissions is the same as those outlined in Table 3 and Table 7.

## 6.5 GHG emission sources not accounted for in GHG inventory

The following emission sources have not been estimated in the GHG inventory:

- Stored $CO_2$ in fire extinguishers other than those used for fire training – The contribution of this emission source to the total GHG inventory is de minimis.
- SF6 – CIAL is not aware of any SF6 sources being used in airport operations.

# 7.0

## GHG inventory

# 7.0 GHG inventory

This GHG inventory is based on the best data available at time of compilation. Based on the data provided and methodologies applied, it is expected that the reported quantity of GHG emissions is not significantly different to the true value.

This GHG inventory will be updated should more up-to-date or accurate data, methodologies, and/or emission factors become available or if any significant errors (i.e., resulting in a difference in the reported GHG inventory of more than 10%) are identified.

Table 16: GHG emissions breakdown

| Emission source | Scope | Category | Tonnes $CO_2$-e | % of total GHG inventory |
|---|---|---|---|---|
| Stationary combustion, diesel | 1 | | 207.88 | 0.03% |
| Stationary combustion, LPG | 1 | | 3.72 | 0.00% |
| Mobile combustion, diesel | 1 | | 48.41 | 0.01% |
| Mobile combustion, petrol | 1 | | 9.89 | 0.00% |
| Fire training, fire extinguishers | 1 | | 0.00 | 0.00% |
| Fire training, LPG | 1 | | 0.13 | 0.00% |
| Fugitive emissions, R1234ze | 1 | | 0.00 | 0.00% |
| Fugitive emissions, R22 | 1 | | 0.14 | 0.00% |
| Fugitive emissions, R417A | 1 | | 9.38 | 0.00% |
| De-icing | 1 | | 0.16 | 0.00% |
| Grid-purchased electricity (market-based) | 2 | | 0.00 | 0.00% |
| Insurance | 3 | 1 | 294.41 | 0.04% |
| Consultant fees | 3 | 1 | 335.57 | 0.04% |
| Accounting, audit, and legal | 3 | 1 | 219.67 | 0.03% |
| ICT data, internet, and cloud services | 3 | 1 | 627.32 | 0.08% |
| Maintenance, gardening | 3 | 1 | 1,522.23 | 0.19% |
| Fertiliser | 3 | 1 | 36.85 | 0.00% |
| Uniforms and protective clothing | 3 | 1 | 8.08 | 0.00% |
| Print & stationery | 3 | 1 | 30.56 | 0.00% |
| Cleaning, consumable products | 3 | 1 | 42.26 | 0.01% |
| De-icing (tenant) | 3 | 1 | 42.27 | 0.01% |
| Water supply | 3 | 1 | 12.40 | 0.00% |
| Building Structures (embodied carbon) | 3 | 2 | 2,134.00 | 0.26% |
| Sealed surfaces | 3 | 2 | 1,089.00 | 0.13% |

| Emission source | Scope | Category | Tonnes $CO_2$-e | % of total GHG inventory |
|---|---|---|---|---|
| Operating surfaces, airside, road, parking | 3 | 2 | 1,006.73 | 0.12% |
| Vehicles | 3 | 2 | 65.68 | 0.01% |
| Electricity, transmission & distribution | 3 | 3 | 83.65 | 0.01% |
| Diesel, extraction, production, & distribution | 3 | 3 | 5.55 | 0.00% |
| Petrol, extraction, production, & distribution | 3 | 3 | 0.66 | 0.00% |
| LPG, extraction, production, & distribution | 3 | 3 | 0.02 | 0.00% |
| Waste to landfill | 3 | 5 | 114.02 | 0.01% |
| Wastewater | 3 | 5 | 169.31 | 0.02% |
| International, long-haul, business | 3 | 6 | 217.73 | 0.03% |
| International, short-haul, business | 3 | 6 | 13.42 | 0.00% |
| International, long-haul, economy | 3 | 6 | 49.11 | 0.01% |
| International, short-haul, economy | 3 | 6 | 5.31 | 0.00% |
| International, long-haul, premium economy | 3 | 6 | 36.24 | 0.00% |
| Domestic, national average | 3 | 6 | 62.08 | 0.01% |
| Business travel, accommodation | 3 | 6 | 9.44 | 0.00% |
| Airport operator staff commute | 3 | 7 | 85.40 | 0.01% |
| Airport staff, working from home | 3 | 7 | 0.26 | 0.00% |
| Full flight | 3 | 11 | 786,862.20 | 97.37% |
| Auxiliary power unit usage, aircraft | 3 | 11 | 1,870.00 | 0.23% |
| Engine run-ups, avgas | 3 | 11 | 0.00 | 0.00% |
| Engine run-ups, single-aisle aircraft with kerosene | 3 | 11 | 0.00 | 0.00% |
| Engine run-ups, double-aisle aircraft with kerosene | 3 | 11 | 247.00 | 0.03% |
| Ground access, tenant staff, visitor vehicles | 3 | 11 | 9,479.40 | 1.17% |
| Electricity, stationary energy | 3 | 13 | 274.84 | 0.01% |
| LPG, stationary energy | 3 | 13 | 93.65 | 0.03% |
| Diesel, stationary energy | 3 | 13 | 602.51 | 0.07% |

# 8.0

# Base year selection and GHG emission recalculation policy

# 8.0 Base year selection and GHG emissions recalculation policy

## 8.1 Base year selection

CIAL's selection of base year for the purpose of its GHG emissions inventory is 2015. The basis for the choice of 2015 as the base year is that it is the most comparative GHG emissions data collected, and for which the GHG emissions will be able to be recalculated in later years (if needed), as required by ISO 14064-1, to enable a meaningful and consistent comparison of GHG emissions over time.

## 8.2 Recalculation policy

To enable a meaningful and consistent comparison of later years' GHG emissions against those of 2015, CIAL requires that a GHG inventory be recalculated in later years, as needed, to account for the following:

1. any structural changes to the organisation, where these include acquisitions and divestments, and the outsourcing and insourcing of GHG-emitting activities;
2. changes in GHG emissions calculation methodology that would result in a significant change to the GHG emissions figure; and
3. the discovery of an error, or a number of cumulative errors, that would have a significant impact on the GHG inventory.

## 8.3 Changes in organisational boundary

In general, GHG inventories are not recalculated for organic growth or decline. According to the GHG Protocol, "organic growth/decline refers to increases or decreases in production output, changes in product mix, and closures and openings of operating units that are owned or controlled by the company". Similarly, ISO 14064-1 states that organisations "shall not recalculate its base-year GHG inventory to account for changes in facility production levels, including the closing or opening of facilities".

The reason for this is that organic growth or decline results in a change of emissions to the atmosphere (as opposed to a mere transfer of emissions from one company's inventory to another in the case of a change in organisational structure) and therefore should be counted as an increase or decrease in CIAL's emissions profile over time.

However, the ACA has different requirements, which are outlined in the ACA Application Manual. To facilitate a like-with-like comparison of the three-year rolling average over time

- "In the case of divestment, the airport shall re-calculate the footprint for the past three years excluding the emissions from the asset which has been divested. These new historical emissions shall be used to calculate the average against which the current year's performance will be compared."
- "In the case of an airport investing in new assets, there will be a period of time where there is not sufficient data to provide a like-for-like comparison against their historical GHG inventories. To balance between the programme's wish to see the impact of the new asset as early as possible and this lack of historical data, until a new asset has been in operation for two full years, the emissions of the new asset shall be reported separately, not as part of the airport's main GHG inventory. Consequently, to identify reductions, only the emissions from the pre-existing asset will be compared to the airport's historical emissions. This will ensure a like-for-like comparison. Once the new asset has been in operation for more than two full years, its emissions data shall be included in the comparison using one of the two approaches set out [in section 8.9 of the ACA Application Manual."

When CIAL replaces an asset without a significant change to its operational boundary (e.g., an old cooling system with a new one), this is not defined as an investment or divestment for the purposes of ACA reporting.

## 8.4 Changes in organisational boundary

It is expected, and encouraged, that improvements to GHG emissions calculations will be made over time. Examples of improvements may include the use of a more accurate emission factor or the addition to the inventory of emissions sources that had previously been considered insignificant. When such improvements are made, the reason for the resulting change in emissions must be documented. Documentation should include details of the new emissions calculation methods used and/or new emissions sources added, any assumptions made, and those parties involved in the decision to make the change.

## 8.5 Changes in organisational boundary

CIAL's GHG inventories will be recalculated in the case of the discovery of an error or a number of cumulative errors that would result in a significant change in the estimate of GHG emissions being reported. The need to recalculate the current or previous years' GHG inventories is based on determining whether the error(s) result(s) in a change (increase or decrease) in the reported GHG emissions of 10% or more.

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