

FY2026 GHG Inventory Report

Basis of Preparation

Christchurch International Airport Limited

Airport Carbon Accreditation Level 5

Prepared against the Level 5 Requirements, Edition 1.0 (January 2026)

Reporting period 1 July 2025 to 30 June 2026

Final report issued to Christchurch International Airport Limited, 17 September 2026

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Contents

1. Introduction	3
1.1 General information.....	3
2. Purpose and intended use	4
3. Alignment with New Zealand Climate Standards and assurance framework	4
4. Organisational boundary and control approach	5
4.1 Boundary and control concepts.....	5
4.2 Application of the operational control approach at CIAL	6
4.3 Inclusion of Scope 3 emissions	7
5. Summary of GHG emission sources included in the FY26 GHG inventory	9
6. GHG emissions quantification approach and data sources	13
6.1 Scope 1 and Scope 2, direct and purchased energy emissions	14
6.2 Scope 3, energy and operations.....	16
6.3 Scope 3, procurement and waste	19
6.4 Scope 3, agricultural activities.....	21
6.5 Data management, quality control and record keeping	22
7. GHG inventory summary	22
7.1 Separately reported non-CO ₂ climate effects of aviation	24
7.2 Trends and comparisons.....	24
7.3 Materiality	26
8. Methodological updates and changes from prior reporting year	26
8.1 Aircraft full-flight emissions and non-CO ₂ effects (Cat. 11).....	26
8.2 Refrigerants moved to the material balance basis (Scope 1).....	27
8.3 Market-based Scope 2 reporting introduced.....	28
8.4 Spend-based emission factors and Category 1 coverage (Cat. 1 and 2).....	28
8.5 Category 13 boundary expansion (Cat. 13)	28
8.6 Agricultural emissions methodology (Cat. 13)	29
8.7 Business travel (Cat. 6)	29
8.8 Emission factor updates	29
8.9 Landside ground access: tenant staff commute correction (Cat. 11)	30
9. Uncertainty assessment and data quality	30
10. Inventory adjustments and base year	31



1. Introduction

This greenhouse gas (GHG) inventory report presents the emissions profile for Christchurch International Airport Limited (CIAL) for the 2025–26 financial year (FY26). It has been prepared to support dual reporting objectives:

- Airport Carbon Accreditation (ACA) Level 5 submission; and
- Mandatory climate-related disclosures under New Zealand's Climate Standards.

Total gross GHG emissions for the reporting year were:

Basis of reporting	Scope 1 (t CO ₂ -e)	Scope 2 (t CO ₂ -e)	Scope 3 (t CO ₂ -e)	Total (t CO ₂ -e)
Location-based	176	1,193	493,336	494,706
Market-based	176	0	493,336	493,513
<i>Separately reported: aircraft non-CO₂ effects (not a GHG, excluded from all totals)</i>	–	–	–	134,761
Total including separately reported non-CO₂ effects (location-based)	–	–	–	629,467

The market-based Scope 2 figure is nil: New Zealand Energy Certificates (NZ-ECs) redeemed for the reporting year cover 100 per cent of CIAL's electricity consumption (section 8.3). The Scope 3 figure includes the corrections and methodology changes described in section 8, which are disclosed rather than restated.

CIAL's inventory includes Scope 1, Scope 2, and a broad set of Scope 3 categories in line with ACA Level 5 expectations and the GHG Protocol. Aircraft-related sources reported under Scope 3 Category 11 represent approximately 94 per cent of reported emissions, with full-flight emissions from departing aircraft alone contributing 90 per cent, highlighting the airport's role as a facilitator of downstream aviation activity.

This report has been prepared in accordance with the GHG Protocol Corporate Accounting and Reporting Standard, the Scope 2 Guidance, the Corporate Value Chain (Scope 3) Standard, the accompanying Technical Guidance for Calculating Scope 3 Emissions, the ACA Level 5 Requirements, Edition 1.0 (January 2026), read together with the ACA Requirements for All Levels, Edition 1.0, and guidance from the New Zealand Ministry for the Environment (MfE). The Edition 1.0 requirements documents supersede the ACA Application Manual (Issue 14) referenced in prior reporting years, and this report is structured to address the GHG Inventory Report content requirements in section 3.5 of the Level 5 Requirements.

It is structured to meet the disclosure requirements set out in Aotearoa New Zealand Climate Standard 1: Climate-related Disclosures (NZ CS 1) and Aotearoa New Zealand Climate Standard 3: General Requirements for Climate-related Disclosures (NZ CS 3), and to support independent assurance in accordance with New Zealand Standard on Assurance Engagements 1: Assurance Engagements over Greenhouse Gas Emissions Disclosures (NZ SAE 1).

1.1 General information

CIAL owns and operates Christchurch Airport, the main gateway to the South Island of New Zealand. The company is jointly owned by Christchurch City Holdings Limited (75 per cent), the investment arm of Christchurch City Council, and the New Zealand Crown (25 per cent). The airport is located at Harewood, approximately 12 kilometres north-west of the Christchurch city centre, and comprises the passenger terminal, two runways, airside and landside operating surfaces, commercial property precincts, and airport-owned rural landholdings leased to third parties.



Key operational metrics for the reporting year include 6,851,111 passengers, 16,615 tonnes of air cargo, 47,152 departing aircraft movements and approximately 216 full-time equivalent (FTE) airport operator staff.

The reporting period is 1 July 2025 to 30 June 2026, consistent with CIAL's financial year. All activity data, certificates and supplier confirmations for FY26 were received before this report was finalised. Data improvements identified during compilation are recorded in section 9 rather than carried as open items.

2. Purpose and intended use

This report documents the basis of preparation for CIAL's GHG inventory for the FY26 reporting period. It supports:

- Submission to the ACA programme; and
- Inclusion in CIAL's climate-related disclosures under the Financial Sector (Climate-related Disclosures and Other Matters) Amendment Act.

The report is intended for multiple audiences:

- Internal stakeholders (management, board, risk and sustainability teams)
- Independent assurance providers
- Regulatory bodies (External Reporting Board, Financial Markets Authority)
- Investors and external reviewers of CIAL's climate-related disclosures

The basis of preparation outlines the methodology, assumptions, boundaries, and data sources used in compiling the GHG inventory. It defines the organisational and operational boundaries, explains how activity data was collected and validated, and documents how emission factors, estimation techniques, and data limitations have been applied. This foundation ensures transparency, consistency, and auditability, meeting the requirements for independent assurance under NZ SAE 1.

To support this broad audience, the content has been structured to balance the technical rigour required for assurance and compliance with a clear, accessible format that promotes traceability and understanding. Methodologies, assumptions, and key decisions are presented using consistent, professional language and supported by relevant standards and references, ensuring the final report is technically robust while remaining appropriate for both technical and non-technical readers.

3. Alignment with New Zealand Climate Standards and assurance framework

This report aligns with the Metrics and Targets requirements in NZ CS 1, as follows:

- Disclosure [22]: Gross GHG emissions are disclosed by scope (1, 2, and 3), including location- and market-based approaches for Scope 2.
- Disclosure [23]: Methodologies, emission factors, assumptions, and limitations are detailed in the methodology section.
- Disclosure [24]: The emissions inventory is prepared using the GHG Protocol Corporate Accounting and Reporting Standard, the Scope 3 Standard, and ISO 14064-1. These are supplemented by airport-specific requirements in the ACA Level 5 Requirements, Edition 1.0 (January 2026), and the ACA Requirements for All Levels, Edition 1.0.
- Disclosure [25]: The emissions boundary is defined using the operational control approach, with a full description of included operations and justifications for exclusions.
- Disclosure [26]: Emissions metrics in this report provide an auditable baseline for use in CIAL's broader climate strategy, risk assessment, and external disclosures.



This report also reflects the qualitative characteristics of useful climate-related information, as outlined in NZ CS 3, including:

- **Relevance:** Focused on emission sources and categories that are material to CIAL's operations and stakeholders.
- **Faithful representation:** Emissions estimates are based on traceable data, reasonable assumptions, and consistent application of standards.
- **Comparability:** Boundaries, categories, and calculation methods are consistent with prior years and internationally recognised frameworks, with methodological changes in FY26 disclosed in section 8.
- **Verifiability:** All data sources, assumptions, and calculation steps are documented to support independent assurance.
- **Understandability:** Presented using structured, professional language with explanatory content appropriate for both technical and non-technical readers.

Although this report does not include scenario analysis or quantified financial impacts of climate-related risks, it provides the emissions baseline and explanatory context that support those assessments in CIAL's broader climate-related disclosure suite. This is consistent with the forward-looking intent of NZ CS 1.

As CIAL is not a first-time preparer of climate-related disclosures, the transitional provisions under NZ CS 2 do not apply.

To support independent assurance in accordance with NZ SAE 1, the report provides the necessary inputs for an assurance practitioner to issue a limited or reasonable assurance conclusion. These include:

- Clear and auditable definitions of scope, boundary, and criteria
- Transparent calculation methodologies, emission factors, and assumptions
- Documented limitations, uncertainties, and estimation techniques
- Alignment with accepted frameworks, such as the GHG Protocol and the ACA requirements documents

These elements directly support the practitioner's responsibilities under:

- NZ SAE 1 paragraphs 7–8, defining the scope of the GHG assurance engagement
- Paragraph 11(a), confirming use of ISO 14064-3 or ISAE (NZ) 3410 as the applicable standard
- Paragraphs 14–27, establishing evidence-gathering and evaluation procedures
- Paragraphs 43–59, setting out the form and content of the independent assurance report

Together, these attributes ensure that CIAL's GHG emissions reporting aligns with the expectations of NZ CS 1, supports formal assurance under NZ SAE 1, and reflects best practice in both carbon accounting and airport-sector climate disclosures.

4. Organisational boundary and control approach

4.1 Boundary and control concepts

To interpret this emissions inventory accurately, it is important to distinguish between three related but distinct concepts:

- **Organisational control:** The authority to introduce and implement operating policies, particularly those relating to health and safety, environmental management, and operational decision-making. Under the operational control approach, an entity is considered to have organisational control where it holds this authority, regardless of ownership or financial interest.



- **Organisational boundary:** The scope of operations included in the GHG inventory, based on where the entity exercises organisational control. This determines which facilities, services, and assets are included for the purposes of Scope 1 and Scope 2 emissions reporting.
- **Operational boundary:** The classification of emissions by scope, based on the nature of the emissions source. Scope 1 covers direct emissions from sources owned or controlled by the reporting entity, Scope 2 covers indirect emissions from the generation of purchased electricity consumed by the entity, and Scope 3 covers other indirect emissions that occur as a result of the entity's operations but originate from sources outside its control (for example business travel, capital goods, and aircraft movements).

This structure reflects the principles outlined in the GHG Protocol, supports the boundary-setting expectations under NZ CS 1 Disclosure [25], and aligns with the requirements of the ACA programme.

4.2 Application of the operational control approach at CIAL

CIAL applies the operational control approach to define its organisational boundary. This method is consistent with the GHG Protocol Corporate Accounting and Reporting Standard and the expectations of NZ CS 1, which require entities to disclose their boundary-setting method and to clearly identify which activities are included or excluded, and why.

Under this approach, CIAL reports 100 per cent of the GHG emissions from operations over which it has operational control, defined as having the greatest authority to introduce and implement operating policies, particularly those relating to work health and safety (WHS), environmental management, energy use, and day-to-day operational practices. Operational control does not require ownership or a financial interest; rather, it depends on the entity's ability to direct how operations are conducted on the ground.

In practical terms, this means CIAL has operational control where it has:

- The primary responsibility and authority to make decisions about how activities are managed
- The power to set and enforce site-level policies relating to WHS, environmental compliance, and operational standards
- The ability to control inputs and outputs, such as resource use, maintenance schedules, and contractor management
- Oversight of compliance with legal and regulatory obligations for areas and activities under CIAL's operational responsibility, including the ability to set and enforce site-wide operational policies.

Note: This does not mean that all activities occurring on airport grounds fall within CIAL's operational control. While CIAL may impose access requirements or procedural expectations (for example, safety protocols and airside behaviour), these do not constitute control over how third parties conduct their core operations. Airlines, ground handlers, and other tenants typically retain their own legal obligations and operational autonomy, and their emissions are treated as Scope 3 unless CIAL has the authority to manage how those emissions-generating activities are undertaken.

This approach is consistent with international practice and reflects the principles embedded in frameworks used in comparable infrastructure sectors.

CIAL exercises operational control over the majority of Christchurch Airport's core infrastructure and services, including:

- Terminal facilities and common-use base building services
- Airside and landside operating surfaces and infrastructure
- Vehicle and equipment fleets managed by CIAL
- Fire training grounds and emergency response areas
- Utility systems and energy infrastructure under CIAL's management
- Corporate offices and shared-use service areas

These facilities and activities define the organisational boundary for Scope 1 and Scope 2 reporting.



4.3 Inclusion of Scope 3 emissions

In addition to emissions from operations under its control, CIAL also reports material Scope 3 emissions from sources outside its organisational boundary, in accordance with the GHG Protocol Scope 3 Standard, NZ CS 1, and the ACA Level 5 Requirements. These emissions result from CIAL's activities and infrastructure but originate from sources that CIAL does not directly control.

Scope 3 categories reported in this inventory cover both upstream and downstream value chain impacts and include:

- Category 1 – Purchased goods and services
- Category 2 – Capital goods (construction materials, plant)
- Category 3 – Fuel- and energy-related activities not included in Scope 1 or 2 (including energy on-charged to tenants)
- Category 5 – Waste generated in operations
- Category 6 – Business travel
- Category 7 – Employee commuting
- Category 11 – Use of sold products (notably full-flight aircraft emissions)
- Category 13 – Downstream leased assets (tenant energy use not managed by CIAL, and agricultural activities on leased airport land)

These inclusions ensure that the inventory captures material indirect emissions arising from CIAL's operations, infrastructure, and broader value chain, even where those sources are outside CIAL's direct control. This approach aligns with ACA Level 5 requirements and the expectations of NZ CS 1, providing a more complete and decision-useful view of CIAL's climate impacts.

Emissions have been classified in accordance with the GHG Protocol Scope 3 Standard, with consistent categorisation applied year on year to ensure comparability. This supports the metric consistency and reliability requirements under NZ CS 1 Disclosure [26] and enables robust external assurance in accordance with NZ SAE 1.

Scope 3 reporting is a mandatory requirement for ACA Level 5, which requires airports to disclose all material upstream and downstream emissions sources. However, it is important to note that ACA's interpretation of Scope 3 categories does not always align with the original intent of the GHG Protocol Scope 3 Standard. The main points of divergence in this inventory are:

- Full-flight aircraft emissions are reported under Category 11 (Use of Sold Products). Under the Level 5 Requirements (section 3.4.32), the airport's product sold is the infrastructure and services that third parties use for the purpose of air travel, and full-flight, auxiliary power unit (APU), and engine run-up emissions are reported on this basis. Under strict GHG Protocol logic, the direct emission-producing activity is the combustion of aviation fuel purchased by an airline from a fuel provider rather than from the airport itself, and it may be more technically accurate to classify this source under other Scope 3. CIAL follows the ACA framework in full, with the classification logic documented for transparency.
- Electricity on-sold by CIAL to tenants is reported under Category 13 (Downstream Leased Assets), following ACA's leased-asset lens, which places all tenant electricity in Category 13 regardless of procurement route. Under the GHG Protocol and the Scope 2 Guidance, electricity purchased and on-sold to end users belongs in Category 3 (Fuel- and Energy-Related Activities, which expressly includes generation of purchased electricity sold to end users), with Category 13 reserved for leased assets where the tenant procures energy from a utility directly. The method question is unaffected: metered tenant electricity is calculated on a location-based basis per Level 5 Requirements section 3.4.13.
- Surface access emissions by passengers, visitors, and tenant and contractor staff are reported in Category 11 under the ACA framework (Level 5 Requirements section 3.4.32). A strict GHG



Protocol reading would spread these journeys across Categories 4 and 9, as well as other Scope 3 categories. Third-party staff commuting has no dedicated GHG Protocol category; the ISO 14064-1 indirect emissions category for client and visitor transport is their natural home.

- Tenant LPG, tenant ground support equipment (GSE) diesel, and agricultural activities on leased airport land are grouped in Category 13 alongside on-sold energy. Under a strict reading, sources not tied to the energy use of a leased asset would fall into other categories or into other Scope 3 categories.
- Freight and transport services procured by CIAL are reported within Category 1 spend rather than Category 4 (Upstream Transportation and Distribution) (section 8.4).
- Business air travel is reported in full under Category 6, including flights departing Christchurch, which are also captured within the Category 11 full-flight figure. This known overlap is retained and disclosed rather than deduplicated, because a deduplication adjustment would be neither feasible nor meaningful at the scale involved (section 8.7).

ACA's treatment reflects a broader sectoral interpretation that prioritises physical enablement and infrastructure-related emissions over strict contractual or value-chain attribution. CIAL has fully followed the ACA framework to maintain alignment with Level 5 accreditation requirements, while ensuring that boundary choices and classification logic are clearly documented for transparency and assurance. This divergence affects only the classification of emission sources within Scope 3. It does not alter the description, characteristics, or underlying emissions estimates associated with those sources.

A source-by-source categorisation map comparing the ACA treatment, a strict GHG Protocol reading, and the ISO 14064-1 indirect emissions categories is maintained in the FY26 calculation workbook. The ACA programme accepts the ISO 14064-1 categories as an alternative presentation (Requirements for All Levels section 4.3.6; Level 5 Requirements section 3.1.2). From FY26, the non-CO₂ climate effects of aviation are excluded from the GHG inventory and separately disclosed; this change is described in sections 7.1 and 8.1.

By clearly distinguishing between operational control (which defines Scopes 1 and 2) and operational relevance (which supports the inclusion of Scope 3), CIAL ensures that its GHG inventory is both comprehensive and defensible. This boundary approach aligns with accepted international frameworks, meets the disclosure expectations of NZ CS 1, and supports robust external assurance under NZ SAE 1.



5. Summary of GHG emission sources included in the FY26 GHG inventory

This section provides an overview of the emission sources included in CIAL's FY26 GHG inventory. Each source is classified by scope and category in accordance with the GHG Protocol and the requirements of the ACA programme. While CIAL follows the GHG Protocol's classification principles, certain sources have been grouped or categorised differently to align with ACA Level 5 expectations. The table below outlines the nature of each emission source, the rationale for its inclusion, and the applicable reporting treatment under both frameworks.

Table 1: Summary of GHG sources in the FY26 GHG inventory

Emission source	Description	Scope	Scope 3 category	Notes on categorisation / ACA treatment
Stationary and transport fuels	Combustion of fuels for both stationary purposes (for example, generators) and transport-related use in CIAL-operated vehicles.	1	–	Standard Scope 1 source under both GHG Protocol and ACA.
Fire training and fire suppression	Controlled combustion of liquefied petroleum gas (LPG) during scheduled emergency training exercises conducted by CIAL, and CO ₂ released from extinguisher use and refills.	1	–	Treated as a direct Scope 1 source under GHG Protocol and ACA.
Fugitive emissions – refrigerants	Emissions from losses of refrigerant gases from heating, ventilation and air conditioning (HVAC) systems and refrigeration plant, quantified on the material balance (top-up) basis from FY26.	1	–	Included as a Scope 1 fugitive source per standard GHG accounting practice. Quantification basis changed in FY26 (section 8.2), consistent with Level 5 Requirements section 3.2.30.
De-icing fluids (CIAL use)	Use of de-icing products by CIAL on paths and car parks.	1	–	Process emissions from the degradation of de-icing chemicals, reported under Scope 1 where CIAL is directly responsible (Level 5 Requirements sections 3.2.34 to 3.2.38).
Grid electricity (CIAL use)	Electricity purchased from the grid for use in terminal facilities,	2	–	Location- and market-based emissions both disclosed from FY26, in line with the GHG Protocol Scope 2 Guidance and Level 5 Requirements section 3.3.4.



Emission source	Description	Scope	Scope 3 category	Notes on categorisation / ACA treatment
	operations, and infrastructure managed by CIAL.			
Aircraft full-flight emissions	Combustion emissions from all aircraft departing Christchurch Airport, based on aircraft type, route, and fuel burn modelling. Each departure carries the emissions of the full flight.	3	11	ACA reports full-flight aircraft emissions in Category 11 (Use of Sold Products) to capture emissions from aircraft operations enabled by the airport's services (Level 5 Requirements section 3.4.32). Under strict GHG Protocol logic, these would fall under other Scope 3 categories; the ACA placement reflects the programme's sectoral interpretation. From FY26, the reported figure is tank-to-wake (TtW) CO ₂ -e for departing flights, with non-CO ₂ effects separately disclosed (sections 7.1 and 8.1).
APU usage and engine run-ups	Emissions from APUs and aircraft engine maintenance (run-ups) while on the ground.	3	11	ACA places APU usage and engine run-ups in Category 11 as part of its grouping for aircraft emissions associated with airport operations (Level 5 Requirements section 3.4.32).
Tenant electricity	Electricity on-charged by CIAL to tenants (via sub-metering), including electrical ground power and pre-conditioned air.	3	13	ACA treats electricity supplied to tenants as Category 13 (Downstream Leased Assets) because it is tenant Scope 2 and therefore airport Scope 3, applying a leased-asset lens rather than the GHG Protocol's energy-retailer lens. Under the GHG Protocol the on-sold portion would be classified as Category 3.
Tenant fuel use	Combustion of LPG on-charged to terminal tenants and diesel used in tenant GSE, including fuel-supplier fleets from FY26.	3	13	Included as downstream leased asset; not under CIAL's operational control. Fuel data from sub-metering, supplier records, or tenant reporting. Boundary expanded in FY26 (section 8.5).
Agricultural emissions	Indirect emissions from agricultural activities on airport-owned land leased to tenant farmers, comprising livestock and fertiliser use.	3	13	Included as downstream leased assets as operations occur on airport-owned land.
Fuel- and energy-related activities	Emissions associated with the upstream production and transmission of fuels and electricity consumed by CIAL and its tenants.	3	3	Expected as part of comprehensive Scope 3 coverage under Level 5 Requirements section 3.4.11, and consistent with the GHG Protocol Scope 3 Standard.
Purchased goods and services	Operational and administrative procurement of goods and services,	3	1	Standard Category 1 inclusion under both GHG Protocol and ACA. Freight and transport spend is retained within Category 1; under a strict GHG Protocol reading



Emission source	Description	Scope	Scope 3 category	Notes on categorisation / ACA treatment
	including freight and transport services procured by CIAL.			it would sit in Category 4 (Upstream Transportation and Distribution), and this divergence is disclosed.
Water	Emissions from water supply based on CIAL's consumption volumes.	3	1	Treated as Category 1 but reported separately from general procurement due to distinct activity-based estimation and data source requirements.
Capital goods	Construction-related purchases and long-lived equipment, such as vehicles, plant, and infrastructure.	3	2	Standard Category 2 inclusion for long-lived asset purchases; typically vehicles and material for infrastructure projects.
Waste disposal	Emissions from landfill, composting, and recycling activities, including both operational and project-related waste streams.	3	5	Reported by waste type, destination, and treatment method; consistent with both ACA and GHG Protocol requirements.
Wastewater	Emissions from wastewater treatment based on CIAL's consumption volumes.	3	5	Although paid for as a service, wastewater is classified under Category 5 (Waste generated in operations), consistent with GHG Protocol guidance.
Business travel	Emissions from air travel, ground transport, and hotel accommodation related to work trips taken by CIAL employees.	3	6	Reported in full under Category 6; flights departing Christchurch are also captured in the Category 11 full-flight figure, an overlap disclosed rather than deduplicated (section 8.7).
Staff commute	Travel between employees' homes and workplace, estimated by mode, distance, and frequency, plus working from home.	3	7	Based on staff surveys and extrapolation; GHG Protocol and ACA aligned (Level 5 Requirements section 3.4.25).
Ground/surface access	Emissions from vehicles accessing the airport site, including tenant/contractor fleets, tenant staff commuting, visitors, taxis, rideshare, buses, and shuttles.	3	11	Treated as Category 11 (Use of Sold Products) under the ACA framework, which includes surface access emissions by passengers, visitors, and third-party employees (Level 5 Requirements section 3.4.32). From a strict GHG Protocol perspective these emissions would fall across Categories 4, 7, and 9 or other Scope 3. Inclusion is justified by CIAL's ownership and operational control over car parks, access roads, and associated infrastructure, which materially enable and influence these emissions.



Emission source	Description	Scope	Scope 3 category	Notes on categorisation / ACA treatment
craft non-CO ₂ climate effects	Non-GHG climate-warming effects of aviation (contrail cirrus, nitrogen oxides, water vapour, soot, and sulphur aerosols) modelled for departing flights.	n/a	n/a	Not GHGs; excluded from the GHG inventory and all totals from FY26 and reported as a separate qualified disclosure (section 7.1). FY25 included an effective forcing uplift within Scope 3 (section 8.1).





6. GHG emissions quantification approach and data sources

This section outlines the methodology for quantifying GHG emissions in CIAL's FY26 inventory. Emissions estimates have been calculated by multiplying measured or estimated activity data by the relevant emission factors, applying appropriate conversion constants, and, where required, additional calculation parameters.

Standard formula: Emissions (t CO₂-e) = activity data × emission factor

Activity data refers to quantitative measures of the extent of an activity that causes GHG emissions. In this inventory, activity data are drawn from direct measurement (metered energy use, fuel dispensing records, waste weight tickets), supplier or contractor invoices and statements, operational logs, asset registers and maintenance records, modelled outputs from recognised sectoral tools (the PACE Performance and Compliance Engine, the ACA Airport Carbon and Emissions Reporting Tool (ACERT), and the Estuaire flight emissions dataset), and financial and procurement records used with environmentally extended input-output (EEIO) factors. Where direct measurement is not practicable, industry benchmarks, engineering estimates, or survey results have been used, with assumptions documented for transparency.

Emission factors convert activity data into GHG emissions, expressed in tonnes of carbon dioxide equivalent (t CO₂-e). The factors used in this inventory are primarily sourced from the MfE Measuring Emissions Catalogue 2026 (published flatfile, version 2), applying 100-year global warming potentials (GWPs) from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5). Factors are looked up live in the calculation workbook by row reference against the published flatfile, with an automated factor-description check on every line. Supplementary sources are used where MfE does not publish a factor: Thinkstep ANZ EEIO factors for spend-based lines, the Australian National Greenhouse Accounts 2025 factors as a proxy for upstream (well-to-tank, WTT) fuel emissions, the BraveTrace residual supply mix factor for market-based Scope 2, and ACERT (v7.2532) for airport-specific sources. As at the time of compiling this report, the MfE 2024 Detailed Guide remains the current methodological guidance.

Each table entry includes the activity data and collection method, primary data sources, emission factor source (cited at source level rather than listing individual factor values), calculation approach, scope, a data quality rating (High, Medium, Low), and key assumptions. For clarity and practicality, the quantification approach is presented in four separate tables:

- Table 2 – Scope 1 and Scope 2 emissions: direct emissions from sources under CIAL's operational control and indirect emissions from purchased electricity, reported using both location- and market-based methods for Scope 2.
- Table 3 – Scope 3: energy and operations: indirect emissions from operational activities that occur outside CIAL's direct control but are materially enabled or influenced by its infrastructure and services.
- Table 4 – Scope 3: procurement and waste: upstream and downstream value chain impacts from purchased goods and services, capital goods, water, wastewater, and operational waste.
- Table 5 – Scope 3: agricultural activities: emissions from livestock and fertiliser use on airport-owned land leased to third parties.



6.1 Scope 1 and Scope 2, direct and purchased energy emissions

Covers CIAL's direct operational emissions and indirect emissions from purchased electricity. These sources are entirely within the airport's operational control and are generally quantified from measured or directly invoiced activity data, providing a high degree of accuracy and traceability.

Table 2: Scope 1 and Scope 2 basis of quantification

Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
Stationary fuel combustion	Fuel volumes (litres/kg) from procurement and asset team logs; LPG derived from retailer kWh data	Finance system; procurement logs; Lumen (retailer) statements	MfE 2026 – Stationary combustion fuels (published flatfile v2)	Volume × EF (by fuel type)	1	High	Direct meter or invoice data; purchases treated as consumption; LPG kWh converted at 0.074 kg/kWh.
Mobile/transport fuel combustion (vehicle fleet)	Fuel card data	Fleet management records; fuel supplier statements	MfE 2026 – Transport fuels (published flatfile v2)	Volume × EF (by fuel type)	1	High	Fuel volume tracked.
Fire training and extinguishers	Volume of LPG and CO ₂ used for training exercises and refills; metered usage or procurement records	Fire training logs; LPG procurement invoices	MfE 2026 – Stationary combustion fuels (published flatfile v2); CO ₂ at GWP 1	Volume × EF	1	High	All LPG used is assumed to be combusted; consistent training format year on year.
Fugitive emissions – refrigerants (HVAC)	Refrigerant purchases and top-ups in the reporting year (material balance basis)	Contractor purchase and service records (Active Refrigeration); chiller plant survey of installed charges (July 2026)	MfE 2026 – Refrigerants (published flatfile v2), AR5 GWPs	Top-up quantity × GWP; refills spanning more than one year annualised pro rata (Level 5 Requirements sections 3.2.30 and 3.2.31)	1	Medium	FY26 purchases and top-ups were nil, so reported fugitive emissions are 0.00 t. Installed charges (R134a 1,250 kg; R1234ze 480 kg; R22 1 kg; R417A 50 kg) are held as reference data, and a default-leakage-rate sensitivity (+138.69 t at 8 per cent of charge) is retained in the workbook. Annual service statements are the completeness control. See section 8.2.



Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
De-icing (CIAL paths and carparks)	Product quantities applied by CIAL	Procurement records; safety data sheets	ACERT de-icing product factor	Quantity × EF	1	Medium	Product composition confirmed by the supplier (Cryotech, September 2026) and held in confidence at the supplier's request; the ACERT factor is retained (the line is below 1 t). The product has been discontinued, so the FY27 line will move to the replacement product.
Grid electricity – CIAL consumption (location-based)	Metered kWh from utility	CIAL electricity invoices	MfE 2026 – Grid electricity (published flatfile v2)	kWh × EF	2	High	Includes all directly metered consumption under CIAL control.
Grid electricity – CIAL consumption (market-based)	Metered kWh less MWh covered by redeemed NZ-ECs	CIAL electricity invoices; Pioneer Energy NZ-EC retirement certificates	BraveTrace New Zealand Energy Certificate System (NZECS) residual supply mix factor (final, July 2024 to June 2025)	Uncovered MWh × residual factor	2	High	MfE publishes no New Zealand residual mix factor, so the industry-published BraveTrace factor is used and disclosed as such. The factor is generation-only, so transmission and distribution (T&D) losses remain location-based under both methods. Reported as a memo item alongside the location-based figure. NZ-ECs redeemed cover 100 per cent of consumption for the reporting year (NZECS statement of position, 27 August 2026), so the market-based figure is nil. See section 8.3.



6.2 Scope 3, energy and operations

Includes energy and operational activities outside CIAL's direct control but materially enabled or influenced by airport infrastructure and services. Examples include aircraft movements, APU use, ground access, tenant energy consumption, and staff commuting. Data is drawn from a combination of measurement, modelling, and estimation, with key assumptions clearly documented.

Table 3: Scope 3 energy and operations basis of quantification

Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
Aircraft – full flight	Departing flights, aircraft type, origin-destination pairs (PACE model)	CIAL movement data; PACE outputs	PACE modelled fuel burn and emissions (TtW CO ₂ -e including CH ₄ and N ₂ O)	Fuel burn model × EF, departures only, full flight per departure	3	Medium	Each departure includes the full flight (Take-Off and Landing, plus Climb, Cruise, and Descent), consistent with Level 5 Requirements section 3.4.32. Cross-checked against the independent Estuaire dataset (98.7 per cent agreement on TtW CO ₂ for departing flights). No effective forcing uplift is applied from FY26; non-CO ₂ effects are separately disclosed (section 7.1). Known undercount of some helicopter movements recorded as a future data improvement.
APU usage	APU use per movement (estimation based on operational schedules)	APU summary; CIAL flight schedules	ACERT (v7.2532)	Estimated average hours × EF	3	Medium	Average runtime per aircraft type.
Engine run-ups	Number and duration of run-ups logged	ETMS maintenance logs; CIAL operations	ACERT (v7.2532) default fuel burn per run-up	Run-ups × default fuel per run-up × fuel EF	3	Medium	Fuel-based approach by engine class (avgas and jet fuel); reconciles exactly to the reported total.
Landside ground access	Traffic counts; modal split; average trip distances	Traffic and parking data; mode share assumptions	ACERT (v7.2532)	Trips × distance × EF	3	Medium	ACERT methodology and modal split inputs. Tenant staff commutes are entered as an average calendar-day figure (8,790 tenant staff scaled by 260 working days over 365); public buses are taken as 30 per cent



Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
							electric, consistent with the regional council's published fleet measure; 21 per cent of shuttles are airport-owned electric vehicles. The tenant commute input was corrected during verification (section 8.9).
Tenant electricity (on-charged)	CIAL sub-metering and finance records	CIAL finance and meter data	MfE 2026 – Grid electricity (published flatfile v2)	kWh × EF	3	High	Based on internal sub-metered data and invoiced energy use; includes electrical ground power and pre-conditioned air. Tenants with their own retail contracts are excluded (assessed as immaterial; section 8.5).
Tenant fuel – LPG (on-charged)	Sub-metered LPG derived from retailer kWh data	Retailer statements; sub-meter records	MfE 2026 – Stationary combustion fuels (published flatfile v2)	kg × EF	3	High	Four terminal tenants on-charged via sub-meters; tenants with direct supplier contracts excluded (immaterial).
Tenant vehicles and GSE – diesel	Fuel volumes reported by tenants and fuel suppliers	Tenant and supplier fuel reports	MfE 2026 – Transport fuels (published flatfile v2)	Litres × EF	3	Medium	Includes airline and ground handler volumes and, from FY26, fuel-supplier fleet diesel (boundary expansion, section 8.5). Contractor diesel excluded; estimation planned for a future year.
T&D losses – electricity	Metered kWh for CIAL and tenant electricity use	CIAL finance and metering records	MfE 2026 – T&D losses (published flatfile v2)	kWh × EF	3	High	Applies to all grid-purchased electricity, whether for CIAL or on-charged to tenants; the same location-based factor applies under both Scope 2 methods.
Upstream extraction, production and distribution of fuels (WTT)	Fuel volumes from procurement, fleet, and tenant records	Finance system; procurement logs; tenant reports	Australian NGA 2025 factors as proxy (MfE does not publish upstream fuel factors)	Volume × EF (by fuel type, via energy content)	3	Medium	Applies to all fuel consumption across Scope 1 and Scope 3, including tenant GSE diesel from FY26. Some volumes are reported by third parties rather than directly metered.
Staff commuting and	Staff mode split, distances, and	Staff survey (FY23); payroll headcount	ACERT (v7.2532); MfE 2026 – Working from	FTE × modelled commute EF;	3	Medium	Derived from staff survey data extrapolated to the workforce (230 headcount, 48 per



Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
working from home	working-from-home days		home (published flatfile v2)	employee days × WFH EF			cent participation, 7.5 working-from-home days); a survey refresh is recommended.





6.3 Scope 3, procurement and waste

Encompasses upstream and downstream value chain impacts from purchased goods and services, capital goods, water and wastewater, and operational waste. Quantification methods rely primarily on financial records paired with EEIO factors, supplemented by activity-based estimates for specific resource and waste streams.

Table 4: Scope 3 procurement and waste basis of quantification

Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
Purchased goods and services	Spend records by category, cleaned of accruals and miscoding	CIAL finance system	Thinkstep ANZ EEIO factors	Spend × sector EF (multi-factor mapping for aggregated categories)	3	Medium	Coverage expanded in FY26 by seven spend categories (section 8.4). Carbon credit purchases and fertiliser spend are excluded from the spend mapping to avoid double counting.
Fertiliser – airfield (CIAL use)	Product quantities converted to kg of nitrogen	Procurement records	MfE 2026 – Fertiliser (published flatfile v2)	kg N × EF	3	High	Urea and DAP converted to nitrogen content before applying the per-kg-N factor.
Capital goods – embodied emissions (material-based)	Project LCAs and construction material quantities	Project LCAs; bills of quantities; contractor reports	Project LCA models and material factors	Project LCA output; material quantity × EF	3	Medium	Covers buildings and sealed surfaces with significant embodied emissions. Project LCAs are used for the ENATEL and DHL buildings, the freight apron is quantified from material quantities in the payment schedule, and the Project Boost office refurbishment, for which no LCA is available, is estimated from the contractor's structural steel quantity.
Capital goods – vehicles (expenditure-based)	Capital expenditure records	CIAL finance system	Thinkstep ANZ EEIO factors	Capex × EF	3	Medium	Vehicle purchases in the reporting year.
Water supply	Metered water consumption	Council water bills	MfE 2026 – Water supply (published flatfile v2)	m ³ × EF	3	High	Direct metering from utility.



Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
Wastewater treatment	Metered wastewater volume or estimated as percentage of water use	Council water bills	MfE 2026 – Wastewater treatment (published flatfile v2)	$m^3 \times EF$	3	Medium	Assumes 100 per cent of water used becomes wastewater.
Operational waste	Waste type and weight by collection contractor	Waste contractor records	MfE 2026 – Waste by type and treatment (published flatfile v2)	$Weight \times EF$	3	High	Landfill with gas recovery; regular reporting from contractors.
Business travel – flights and accommodation	Travel bookings and finance records by cabin class, haul, and destination country	Travel portals; expense systems	MfE 2026 – Aviation (with radiative forcing, RF) and accommodation factors (published flatfile v2)	$Passenger-km \times EF \text{ by class; room nights} \times EF \text{ by country}$	3	High	Reported in full, including flights departing Christchurch; the overlap with Category 11 is disclosed rather than deduplicated (section 8.7). Accommodation reported across thirteen countries.
Business travel – taxi	Taxi spend	Expense systems	MfE 2026 – Taxi dollars-spent factor (published flatfile v2)	$Spend \times EF$	3	Medium	Spend-based line introduced in FY26 following discontinuation of the prior taxi and mileage records (section 8.7); reimbursed private mileage assessed as immaterial.
De-icing – tenant aircraft	Product quantities applied by third parties	Tenant reporting	ACERT de-icing product factor	$Quantity \times EF$	3	Medium	Reported within Category 1 as a contracted product stream under the ACA framework. The applied product (Kilfroast DF Plus) is a Type I propylene-glycol fluid per its safety data sheet, and the ACERT glycol (aircraft) factor is applied; this replaced an earlier product-row mapping during verification (approximately +48 t).



6.4 Scope 3, agricultural activities

Accounts for emissions from livestock and fertiliser use on airport-owned land leased to third-party operators. From FY26, these are calculated using the MfE per-head livestock factors from the Measuring Emissions Catalogue, replacing the previously used MfE Agricultural Emissions Calculator (section 8.6).

Table 5: Scope 3 agricultural activities basis of quantification

Emission source	Activity data & collection method	Primary data sources	Emission factor source	Calculation approach	Scope	Data quality	Key assumptions
Livestock and farm fertiliser – tenant farms	Number of animals by type at 30 June and grazing patterns; fertiliser quantities converted to kg N	Tenant lease records; stock counts confirmed by source owners; site inspections	MfE 2026 – Livestock per-head and fertiliser factors (published flatfile v2)	Animals × per-head EF (by animal type); kg N × EF	3	Medium	Covers the tenant and contractor farming operations on airport land, all confirmed as sheep and beef cattle grazing operations (MfE non-dairy cattle and sheep per-head factors applied). For one farm (Spiers), livestock activity is estimated proportionally to a neighbouring operation based on grazable land area, disclosed as a proxy estimate (approximately 0.25 per cent of the inventory). Farm fuel and electricity use is not obtainable and is excluded (disclosed).



6.5 Data management, quality control and record keeping

Activity data is collected by CIAL's sustainability function from finance systems, metering, supplier statements, and operational records, and compiled in CIAL's emissions register. Conversio Pty Ltd independently reviews the register and maintains the FY26 calculation workbook, in which every MfE-sourced emission factor is looked up live by row reference against the published flatfile, with an automated description check; control totals reconcile calculated results to CIAL's register; and a change log records each revision. Findings from the independent review were issued to CIAL in a findings register, worked through in two rounds of responses, and closed or carried as disclosed items in this report.

Verification of the FY26 inventory was undertaken by TÜV SÜD in accordance with ISO 14064-3, with reasonable assurance for Scope 1 and Scope 2 and limited assurance for Scope 3, consistent with prior years; the verification report and opinion were issued on 10 September 2026, and the livestock factor correction described in section 8.6 was made after that date, so an updated opinion aligned to the figures in this report has been requested. The ACA-specific components of the Level 5 verification are scheduled for October and November 2026. Evidence supporting each data point (invoices, certificates, contractor statements, model outputs) is retained in CIAL's document management system and made available to the verifier through a shared evidence folder. Roles and responsibilities are defined: CIAL's Sustainability Advisor is responsible for data collection and the emissions register; CIAL's sustainability leadership is responsible for oversight; and Conversio is responsible for independent review and preparation of this report.

7. GHG inventory summary

The inventory covers the following GHGs defined under the Kyoto Protocol and recognised by the GHG Protocol and NZ CS 1:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Where material, the inventory also includes emissions from other synthetic gases used in refrigerant and fire suppression systems, including hydrofluoroolefins (HFOs).

The following table summarises CIAL's GHG emissions for the reporting year, with prior-year comparatives. Emissions are presented by source and allocated to Scope 1, Scope 2, or Scope 3 in accordance with the GHG Protocol. Scope 3 sources are further classified against the relevant categories defined by the GHG Protocol.

Emissions are reported in tonnes of carbon dioxide equivalent (t CO₂-e) using 100-year GWPs from the IPCC AR5. All estimates have been calculated by multiplying activity data and expenditure data by the relevant emission factors and applying the appropriate conversion constants.

If an amount is calculated that is not a whole number, the result is rounded as follows: the number is rounded up to the next whole number if the digit at the first decimal place equals or exceeds five, and rounded down if it is less than five. Values below one tonne are shown as "<1". Percentages are presented without rounding to whole numbers, as flight-related emissions constitute the vast majority of the inventory and maintaining decimal precision provides a clearer understanding of the relative contribution of other sources.

Table 6: CIAL's GHG emissions inventory by source, scope, and Scope 3 category



Source	Scope	Scope 3 category	FY26 (t CO ₂ -e)	FY25 (t CO ₂ -e)	% of FY26 total
Stationary fuel combustion	1	N/A	135	197	0.03
Mobile fuel combustion	1	N/A	40	49	0.01
Fire training and extinguishers	1	N/A	<1	<1	<0.01
Refrigerants	1	N/A	0	10	0.00
De-icing (CIAL use)	1	N/A	<1	<1	<0.01
Electricity (location-based)	2	N/A	1,193	1,503	0.24
Electricity (market-based)	2	N/A	0	0	memo
Purchased goods and services	3	1	6,660	2,010	1.35
Capital goods	3	2	11,307	2,564	2.29
Fuel- and energy-related activities	3	3	362	336	0.07
Waste generated in operations	3	5	385	263	0.08
Business travel	3	6	352	350	0.07
Employee commuting	3	7	75	84	0.02
Full-flight emissions (departing flights)	3	11	447,607	701,532	90.48
APU usage	3	11	1,203	1,135	0.24
Engine run-ups	3	11	162	244	0.03
Landside ground access	3	11	17,340	10,044	3.50
Tenant electricity consumption (on-charged)	3	13	243	302	0.05
Tenant fuel consumption	3	13	785	591	0.16
Agricultural emissions	3	13	6,857	4,868	1.39
TOTAL (location-based)			494,706	726,084	100
TOTAL (market-based)			493,513	724,581	100
<i>Separately reported: aircraft non-CO₂ climate effects (Estuaire)</i>	<i>n/a</i>	<i>n/a</i>	<i>134,761</i>	<i>in full flight</i>	<i>n/a</i>
TOTAL including non-CO₂ effects (location-based)			629,467	726,084	<i>n/a</i>

The separately reported non-CO₂ line is shown within the table for completeness; it is not a GHG and is not included in either total (section 7.1). The final row combines the location-based total with the separately reported non-CO₂ effects to produce an all-effects figure comparable to prior years, in which those effects were embedded in the totals via the RF multiplier. Its FY25 equivalent is embedded in the full-flight comparative via the RF multiplier and then applied (section 8.1). The FY25 comparatives are as verified. The FY25 business travel figure as published understated the category by 0.65 t (section 8.7). Percentages are calculated on the location-based total; the market-based Scope 2 line is a memo item and is not included in the location-based total. FY26 refrigerant emissions of 0.00 t reflect the material balance basis with nil top-ups in the year (section 8.2).

Note on flight emissions year by year



The FY26 full-flight figure of 447,607 t does not represent a reduction in flight emissions. The FY25 comparative of 701,532 t includes the 1.7 radiative forcing multiplier applied to the CO₂ component under the method used in that year. On the same GHG-only basis, FY25 full-flight emissions were 418,457 t, so FY26 full-flight emissions are 7 per cent higher, in line with the growth in passengers and aircraft movements. The two components are set out year by year in Table 9 (section 8.1), and the separately reported non-CO₂ effects for FY26 are in Table 7 (section 7.1).

Movements in the other lines are explained in section 7.2 and section 8: business travel is stable year on year, refrigerants are nil under the material balance basis, landside ground access reflects the tenant staff commute correction, and the Category 1, 2 and 13 increases reflect expanded coverage, project life cycle assessments and boundary changes rather than underlying growth.

7.1 Separately reported non-CO₂ climate effects of aviation

Aviation causes climate warming beyond its GHG emissions, through contrail cirrus formation, nitrogen oxides (NO_x), water vapour, soot, and sulphur aerosols. These effects are not GHGs under the Kyoto Protocol, are not part of the GHG inventory, and are never summed into any total in this report. From FY26, they are reported as a separate qualified disclosure, modelled by Estuaire using a contrail cirrus prediction (CoCiP) based methodology for departing flights over the reporting period:

Table 7: Separately reported non-CO₂ climate effects, departing flights, FY26

Component	t CO ₂ -e equivalent
Nitrogen oxides (NO _x)	75,395
Contrail cirrus	71,231
Water vapour	10,406
Soot	5,023
Sulphur aerosols (SO _x , cooling)	-27,294
Total non-CO₂ effects	134,761

The equivalent contrail RF index for departing flights is 1.157 for the reporting year. The departures-only, full-flight basis was confirmed with the ACA administrator as the preferred presentation, rather than halving an all-movements figure. The scientific uncertainty associated with contrail and NO_x warming metrics is very high, which is why this disclosure falls outside the GHG inventory. In prior years, an RF multiplier was instead applied to aircraft CO₂ within Scope 3; the change is described in section 8.1.

For completeness, Estuaire's modelled totals for departing flights over the reporting period are also reported separately here: TtW CO₂ of 453,458 t and WTT CO₂ of 97,754 t, a combined 551,212 t CO₂-e. The WTT component represents upstream fuel production emissions that sit outside Category 11 and outside CIAL's inventory boundary. These figures are disclosed for transparency and as a cross-check on the PACE-based inventory figure; they are not summed into any total in this report.

7.2 Trends and comparisons

Scope 1 emissions decreased by 31 per cent, from 257 t to 176 t. The largest movements are stationary diesel, which fell by approximately 20 per cent after network load-shedding generation ceased in November 2025, and refrigerants, which are reported at nil under the material balance basis adopted in FY26 (10 t in FY25 under the prior default-leakage approach). The load-shedding exit was foreshadowed in CIAL's Emission Reduction Plan (ERP), which identifies battery energy storage as the longer-term substitute for diesel generation support. The FY26 result also restores headroom against the Level 5 obligation to maintain at least a 90 per cent absolute reduction in Scope 1 and Scope 2 emissions, after Scope 1 had drifted from 219 t in FY22 to 280 t in FY24 against a maintenance threshold of approximately 354 t; the plan identifies fire fleet transition timing and refrigerants as the remaining drivers to manage,



with the electric fire appliance programme and refrigerant plant upgrades as the corresponding mitigations.

Scope 2 location-based emissions decreased by 21 per cent, from 1,503 t to 1,193 t, on broadly stable consumption. The movement is driven principally by the lower published grid emission factor (0.1011 to 0.0787 kg CO₂-e per kWh), reflecting decarbonisation of New Zealand grid generation. On a market basis, certificate procurement under the NZECS has kept Scope 2 at or near nil since FY22, and the ERP carries this approach forward alongside the development of renewable generation at the Kōwhai Park precinct.

Scope 3 emissions decreased by 32 per cent, from 724,325 t to 493,336 t. This movement is dominated by the change in the flights methodology (the removal of the RF uplift from Category 11, with non-CO₂ effects now separately disclosed) rather than by underlying activity, which was broadly stable. Working against that decrease, Categories 1, 2, and 13 increased through expanded spend coverage, project LCAs, corrections, and boundary expansion, and the landside ground access line within Category 11 increased following the correction of the tenant staff commute input (section 8.9), as described in section 8. Year-on-year comparisons at category level should be read together with the methodological notes in that section.

Looking forward, the Scope 3 trajectory is largely a stakeholder story, and the initiatives in ERP and stakeholder partnership work act directly on the largest lines in Table 6. Fixed electrical ground power and pre-conditioned air at the terminal displace APU fuel burn, charging infrastructure supports the electrification of tenant GSE fleets, the hydrogen consortium and sustainable aviation fuel advocacy address the full-flight line over the longer term, and the progressive electrification of the public bus fleet, acts on landside ground access. CIAL does not currently hold an airport-owned Scope 3 target; the plan relies on alignment with stakeholder targets, and an airport-owned target with a modelled Scope 3 trajectory is being formulated as part of the current plan revision.

The verified inventory trajectory is summarised below, based on the independent verification opinions. Scope 3 methodology has evolved, notably for flights, so the trajectory is not fully like-for-like.

Table 8: Verified inventory trajectory (t CO₂-e, location-based)

	FY2022 (verified)	FY2023 (verified)	FY2024 (verified)	FY2025 (verified)	FY2026 (final)
Scopes 1 + 2	1,758	1,284	1,322	1,760	1,369
Scope 3	534,906	708,146	807,762	724,324	493,336
Total	536,664	709,430	809,084	726,084	494,706
<i>of which non-CO₂ / RF effect</i>	240,046	320,636	372,724	283,075	134,761 (separate)
GHG total excluding non-CO₂ (derived)	296,618	388,794	436,360	443,009	494,706
Total including non-CO₂ effects	536,664	709,430	809,084	726,084	629,467

Sources: Ruby Canyon Environmental verification reports (FY2022 and FY2023); TÜV SÜD verification opinions (FY2024 and FY2025), all unmodified, issued under ISO 14064-3 with reasonable assurance over Scopes 1 and 2 and limited assurance over Scope 3. The FY2023 figures are as stated in the Ruby Canyon Environmental verification report dated 6 October 2023 (Scopes 1 and 2 1,283.68 t; Scope 3 708,145.89 t; total 709,429.57 t). The FY2022 and FY2024 opinions tabulate Scopes 1 and 2 combined. In the years through FY2025, the non-CO₂ effects of aviation are embedded in the Scope 3 figures via the RF multipliers applied; the FY2026 figure is the separately disclosed Estuaire estimate and is not included in the FY2026 totals. The prior-year non-CO₂ amounts are as compiled by CIAL from the historical workbooks (Table 9); the FY2025 amount is the balancing figure to the verified reported total under the 1.7-



on-CO₂ method. The final two rows present the GHG-only and all-effects series so each reads on a like basis across years.

7.3 Materiality

Materiality for verification is applied in accordance with the ACA Requirements for All Levels (section 5.5). Under Edition 1.0, an error is generally considered material if it exceeds five per cent of the total emissions within a given scope category, for example, any of the four categories of Scope 1 or the fifteen categories of Scope 3 (section 5.5.4). This is a change from prior programme practice, under which materiality was assessed against the total GHG inventory. The acceptable level remains determined by the verifier having regard to the agreed level of assurance (section 5.5.2), smaller discrepancies may still be deemed material where they affect the airport's ability to meet programme requirements, such as maintaining the 90 per cent Scope 1 and 2 reduction (section 5.5.4), and Scope 3 sources for which the threshold is difficult to test are assessed with a limited level of assurance and professional judgment (section 5.5.5).

The per-category basis has two practical consequences for this inventory. For Category 11, five per cent of the category is approximately 23,300 t, so the flights model effectively governs the accuracy of the inventory total, and the cross-checks and uncertainty assessment in section 9 address that concentration. For the small categories, the per-category basis is more demanding than an inventory-level test: five per cent of Category 3, for example, is approximately 18 t, so an error far too small to move the inventory total can still be material within its own category. Data quality effort and verification sampling are directed accordingly.

8. Methodological updates and changes from prior reporting year

Several updates to emissions estimation methodologies have been applied in the FY26 GHG inventory to reflect improved data quality, updated scientific guidance, and clarification of treatment expectations under the ACA programme and the GHG Protocol. In each case, the FY25 comparatives are retained as verified, with the change disclosed rather than restated; the rationale is set out in section 10. These changes are summarised below.

8.1 Aircraft full-flight emissions and non-CO₂ effects (Cat. 11)

Emissions from aircraft movements are calculated using the PACE methodology, which models aircraft fuel burn based on flight-level data, aircraft type, engine configuration, distance flown, and airport-specific operational conditions. The reported figure is TtW CO₂-e, including the CH₄ and N₂O components of combustion, for departing flights, with each departure carrying the emissions of the full flight. The departures-only, full-flight boundary was confirmed with the ACA administrator during the reporting year as the preferred presentation. PACE outputs were cross-checked against the independent Estuaire dataset for the same period, which reports 453,458 t of TtW CO₂ for departing flights, compared with the PACE figure of 447,607 t, yielding an agreement of 98.7 per cent.

In previous inventories, the additional climate impacts of aviation beyond direct GHG emissions (contrails, water vapour, and NO_x) were represented by applying an RF multiplier to aircraft CO₂ within Scope 3, drawn from the UK Government GHG conversion factors methodology (DEFRA, latterly DESNZ): no non-CO₂ estimate was included before FY22, a multiplier of 1.9 was applied from FY22 to FY24, and this was revised to 1.7, applied to the CO₂ component only, in FY25. Full-flight emissions were first reported in FY19. From FY26, CIAL has moved away from the DEFRA-derived multiplier altogether. Non-CO₂ effects are instead disclosed separately, using modelled tonnes for departing flights supplied by Estuaire (section 7.1), and no uplift is applied within the GHG inventory. This change recognises that non-CO₂ effects are not GHGs, replaces a generic UK fleet-average multiplier with modelling specific to Christchurch traffic, and avoids combining research-grade warming metrics with the GHG inventory. It is the single largest driver of the year-on-year movement in Category 11 and in the inventory total.



The treatment of flight emissions has matured in successive stages: full-flight emissions were not reported before FY19; were reported without any non-CO₂ estimate from FY19 to FY21; carried a generic multiplier from FY22 to FY25; and are accompanied by flight-specific modelled non-CO₂ data from FY26. The two components of the figures therefore need to be read differently. The Kyoto GHG component is calculated on a consistent CO₂-e basis and can be compared directly across the years in which it was reported. The non-CO₂ column estimates the same additional climate effects in each year, but on different bases, so movements in that column reflect the estimation method as much as the underlying effects. Prior years are presented as reported under each year's method and have not been remodelled. The table below sets out both components side by side with the treatment applied in each year.

Table 9: Full-flight emissions and non-CO₂ / RF treatment by year

Year	Full-flight GHG emissions (t CO ₂ -e)	Non-CO ₂ / RF effect (t CO ₂ -e)	Total (t CO ₂ -e)	Method and treatment
FY2018 and prior	–	–	–	No full-flight emissions reported.
FY2019	477,874	–	477,874	Full-flight emissions first reported; no RF or non-CO ₂ effects included.
FY2020	373,987	–	373,987	No RF or non-CO ₂ effects included.
FY2021	213,811	–	213,811	No RF or non-CO ₂ effects included.
FY2022	272,851	240,046	512,897	Multiplier of 1.9 applied (DEFRA); combined figure reported within Scope 3
FY2023	356,262	320,636	676,898	Multiplier of 1.9 applied (DEFRA); combined figure reported within Scope 3
FY2024	414,138	372,724	786,862	Multiplier of 1.9 applied (DEFRA); combined figure reported within Scope 3
FY2025	418,457	283,075	701,532	Multiplier of 1.7 applied to the CO ₂ component (DESNZ 2025); combined figure reported within Scope 3
FY2026	447,607	134,761	582,368	Modelled non-CO ₂ effects (Estuaire); GHG figure reported in the inventory, non-CO ₂ effects disclosed separately

CIAL compiled prior-year figures from the historical workbooks. The full-flight GHG column is the Kyoto-gas CO₂-e figure and is directly comparable from FY2019 onward. The non-CO₂/RF column cannot be compared directly across methods. It should be read as a technical estimate: a generic multiplier estimate for FY2025 and flight-specific modelling of the physical effects from FY2026. The FY2025 non-CO₂ amount is the balancing figure to the verified reported total of 701,532 t under the 1.7-on-CO₂ method. In FY2026, only the full-flight GHG figure of 447,607 t enters the inventory total; the combined 582,368 t is shown, so the presentation adds up on the same basis as prior years.

8.2 Refrigerants moved to the material balance basis (Scope 1)

In prior years, fugitive refrigerant emissions were estimated using a default annual leakage rate applied to estimated installed charges. During FY26, a contractor survey of the chiller plant established the



installed charges with confidence for the first time, and contractor purchase records confirmed that no refrigerant was purchased or added during the reporting year. From FY26, fugitive emissions are quantified on a material-balance (top-up) basis for all four gases in use, consistent with the first-listed method in Level 5 Requirements section 3.2.30, with refills that occur less often than annually, prorated across the period since the previous refill (section 3.2.31).

Based on this, FY26 fugitive emissions are 0.00 t. The installed charges are retained as reference data, and a sensitivity applying the previous default-rate approach (+138.69 t, which would bring Scope 1 to 315 t) is documented in the calculation workbook to bound the completeness risk of undetected leakage between services. Annual contractor service statements have been identified as the ongoing completeness control. The verifier reviewed the revised treatment and closed the related corrective action request in August 2026. The FY25 comparative (10 t under the prior approach) is retained as verified, with the change in methodology disclosed.

8.3 Market-based Scope 2 reporting introduced

FY26 is the first year in which CIAL reports Scope 2 under both the location-based and market-based methods in this report, in line with Level 5 Requirements section 3.3.4 and the GHG Protocol Scope 2 Guidance. The NZECS statement of position for CIAL dated 27 August 2026 confirms that 18,109 NZ-ECs were redeemed through Pioneer Energy against 18,108.32 MWh of consumption reported for the reporting period, equivalent to 100 per cent coverage of CIAL's metered consumption, with the certificates sourced from Pioneer hydro and wind generation in the same market and within the one-year time-matching requirement. Any uncovered volume would be multiplied by the BraveTrace NZECS residual supply mix factor (106.98 kg CO₂-e per MWh, final factor for July 2024 to June 2025, the latest published). MfE does not publish a New Zealand residual mix factor, so this industry-published factor is used and disclosed as such. The residual factor is generation-only, so T&D losses remain location-based under both methods. With full coverage, the market-based Scope 2 figure for FY26 is nil.

As required by the Scope 2 Guidance (section 1.10 and Appendix B), CIAL discloses that Scope 3 Category 3 (upstream fuel and electricity emissions and T&D losses) and tenant electricity under Category 13 are calculated on the location-based basis under both Scope 2 methods. The Guidance requires disclosure of the basis rather than a dual market-based Scope 3 calculation, and certificates flow through to T&D losses only where they are retired to cover the loss volumes, which CIAL's certificates are not. For metered tenant electricity, the Level 5 Requirements (section 3.4.13) likewise require the location-based methodology, with a market-based figure optional.

8.4 Spend-based emission factors and Category 1 coverage (Cat. 1 and 2)

Spend-based Scope 3 calculations use Thinkstep ANZ EEIO factors from FY26, replacing the Market Economics consumption emissions factors used in FY25. In parallel, Category 1 spend coverage has been expanded to include seven categories (employee services, other travel expenses, freight and transport, government and statutory charges, professional memberships, property and real estate services, and miscellaneous spend), bringing approximately \$15 million in previously unmapped spend into the inventory. Together, these changes more than triple the reported Category 1 figure; the increase reflects coverage and factor changes rather than underlying procurement growth, and year-on-year comparison at category level is qualified accordingly. Carbon credit purchases and fertiliser spend are excluded from the spend mapping to avoid double counting with their dedicated lines. Freight and transport spend is retained within Category 1, although a strict GHG Protocol reading would place it in Category 4; this divergence in presentation is disclosed.

8.5 Category 13 boundary expansion (Cat. 13)

Tenant GSE diesel now includes fuel-supplier fleet volumes in addition to airline and ground handler volumes, and the volumes of a handler whose data was unavailable in the prior year have been restored. The Category 13 boundary is documented in full in the calculation workbook: on-charged electricity and



LPG are included from sub-metered data, while tenants holding their own retail energy contracts, and wider precinct tenants for whom CIAL charges network lines only, are excluded on materiality grounds (the included on-sold electricity represented 0.04 per cent of the FY25 inventory). Contractor diesel remains excluded, with estimation planned for a future year.

8.6 Agricultural emissions methodology (Cat. 13)

Agricultural emissions from livestock grazing on airport-owned land are calculated from FY26 using the MfE per-head livestock factors from the Measuring Emissions Catalogue 2026, replacing the MfE Agricultural Emissions Calculator (which embedded 2022 factors) used in prior years. Fertiliser inputs are converted to kilograms of nitrogen before the per-kg-N factor is applied. All three farming operations are sheep and beef cattle grazing operations, and the MfE non-dairy cattle and sheep per-head factors are applied. An earlier compilation had recorded the properties as dairy operations; this was corrected before issue on confirmation from the graziers and CIAL, reducing the line by 2,651 t against the figure first submitted for verification. One farm remains a disclosed proxy estimate. The factor-vintage alignment and method change contribute to the year-on-year increase in this line and are disclosed as a methodology change.

8.7 Business travel (Cat. 6)

Business travel is reported in full under Category 6, including flights departing Christchurch. Those departures are also captured, at aircraft level, within the Category 11 full-flight figure, so a known overlap exists between the two categories. In FY25, flights departing Christchurch were excluded from Category 6 to avoid this double count; from FY26, the category is reported in full, and the overlap is disclosed instead, which also qualifies the year-on-year comparison for this category.

A deduplication adjustment was assessed and set aside on three grounds. First, the overlap is bounded above by the Category 6 air travel component, at a few hundred tonnes at most, compared with a Category 11 line of 447,607 t, below 0.1 per cent of the inventory, so that no adjustment could produce a significant change to the emissions profile. Second, the two lines are not calculated on subtractable bases: Category 6 is estimated from passenger-kilometres by cabin class using MfE average factors, while Category 11 is modelled at aircraft level from fuel burn, and the flights model carries an uncertainty of around ± 5 per cent (approximately $\pm 22,400$ t, section 9), several orders of magnitude larger than any adjustment. Subtracting a passenger-based estimate from an aircraft-based model would therefore introduce spurious precision rather than accuracy. Third, the two categories answer different questions: Category 6 measures the travel footprint that CIAL's own travel policy controls, and Category 11 measures the aviation activity the airport's infrastructure enables; truncating either would understate the answer to its own question and weaken comparability, with other airports for Category 11 and with other organisations' business travel reporting for Category 6. The effect of the retained overlap on the Scope 3 total is an overstatement of at most the overlap amount, below 0.1 per cent, and is disclosed on that basis.

Taxi travel is reported on a spend basis from FY26, following the discontinuation of the prior taxi and mileage records. Reimbursed private vehicle mileage was assessed at approximately 3% of the taxi total and is immaterial. During the FY26 review, an error was identified in the FY25 workbook: two accommodation rows were omitted from the category total, understating FY25 business travel by 0.65 t (the correct FY25 figure is 350.50 t). The error is immaterial and is disclosed rather than restated.

8.8 Emission factor updates

The FY26 inventory applies the MfE Measuring Emissions Catalogue 2026 (published flatfile, version 2). Notable factor movements against the factors applied in FY25 include grid electricity (0.1011 to 0.0787 kg CO₂-e per kWh), which drives most of the Scope 2 decrease, and landfill waste with gas recovery (0.2033 to 0.3338 kg CO₂-e per kg), which increases the waste line despite broadly similar tonnage. The R417A GWP moved from an AR4 value of 2,346 to the MfE AR5-consistent value of 2,127.32. Regular annual



emission factor updates apply to the corresponding reporting year and do not trigger recalculation of historical inventories or the base year (Level 5 Requirements section 4.4.2).

8.9 Landside ground access: tenant staff commute correction (Cat. 11)

During verification, the ACERT input for tenant staff surface access (an average number of tenant staff commutes per calendar day, which ACERT multiplies by 365) was found to have been entered as 1 in the FY26 compilation, so tenant staff commuting was effectively excluded from the landside ground access line. The input has been corrected to 6,021 commutes per day, derived from 8,790 tenant staff scaled by 260 working days over 365; this remains conservative, as it assumes every tenant staff member travels to the airport individually on each working day. At the same time, the public bus input was set to 30 per cent electric, consistent with the regional council's published fleet measure, in place of the previous assumption that the core airport route was wholly electric, and the shuttle input was set to 21 per cent airport-owned electric shuttles, from car park data. The landside ground access line increased from 9,981 t to 17,340 t as a result and is now 3.5 per cent of the inventory. Airport operator staff commuting is unaffected, as it is calculated separately under Category 7. The FY25 comparative (10,044 t) is retained as verified; whether the same input affected prior years has not been established and is recorded as a data improvement.

9. Uncertainty assessment and data quality

ISO 14064-1 (section 8.3) requires an assessment of uncertainty at the GHG inventory category level and permits a justified qualitative assessment where quantitative estimation is not cost-effective; that is the approach taken here. The Level 5 Requirements (section 3.4.32) additionally require that the flight calculation approach be described, along with its justifications and uncertainties. Ratings are anchored to the factor uncertainties published by MfE for each factor row, which are tracked live in the calculation workbook, and to the character of each data source.

Table 10: Qualitative uncertainty assessment by inventory area

Inventory area	Rating	Basis
Scopes 1 and 2 – metered fuels and electricity	Low	Invoiced or metered volumes. MfE combustion factors carry approximately ± 1 to 2 per cent CO ₂ -e uncertainty (the CH ₄ and N ₂ O components are ± 50 per cent but a small share of each factor). The grid factor is a national annual average; the market-based figure depends on the timing of certificate coverage rather than on measurement.
Refrigerants (top-up basis)	Low data, completeness-sensitive	Contractor purchase and service records are objective; the residual risk is undetected leakage between services rather than mismeasurement. Bounded above by the default-rate sensitivity (+138.69 t); annual service statements are the completeness control.
Category 1 spend-based (EEIO)	High	Sector-average dollar factors inherit price-versus-quantity distortion and sector-mix assumptions; the GHG Protocol data hierarchy treats spend-based EEIO as screening quality. The improvement path is supplier-specific data for the largest spend lines.
Category 2 capital goods	Moderate to high	Project LCAs are model-based with project-specific assumptions; one project (the Project Boost refurbishment) is estimated from the structural steel quantity rather than an LCA.



Inventory area	Rating	Basis
Category 11 flights	Moderate, and dominant	Model-based (PACE TtW). This one line accounts for about 90 per cent of the inventory, so the total inventory uncertainty is effectively the flights-model uncertainty: a ± 5 per cent movement is approximately $\pm 22,400$ t, more than the combined uncertainty of every other Scope 3 category. Mitigations include the 98.7 per cent cross-check against the independent Estuaire dataset and confirmation that PACE reports CO ₂ -e including CH ₄ and N ₂ O.
Ground access and commuting (ACERT)	High	ACERT model defaults and survey inputs: working from home is based on the FY23 survey (refresh recommended).
Utilities, waste and agriculture	Moderate to high	Wastewater factor uncertainty is ± 40 per cent (CH ₄) and ± 90 per cent (N ₂ O) per MfE; the landfill factor is sensitive to the gas-recovery assumption; livestock per-head factors are approximately ± 54 per cent per the catalogue; one farm line is a disclosed proxy estimate.
Non-CO ₂ disclosure	Very high (disclosed as such)	Contrail cirrus and NO _x warming metrics are research-grade and subject to high scientific uncertainty, which is why the line sits outside the GHG inventory as a separate qualified disclosure and is never summed into any total.

These ratings steer verification sampling and the data improvement plan (supplier-specific Category 1 data for the largest spend lines, a working-from-home survey refresh, continued confirmation of the flights model lineage, and annual refrigerant service statements). They do not change any reported figure. Materiality remains a distinct concept, set by the verifier at each assurance level, as described in section 7.3.

10. Inventory adjustments and base year

No structural changes (mergers, acquisitions, or divestments) occurred during FY26, and no changes to the organisational boundary were made. The methodological changes described in section 8 (the flights presentation, the refrigerant quantification basis, the agricultural method, and the spend-based factor source) have been applied prospectively from FY26, with the FY25 comparatives retained as verified and each change disclosed. This treatment preserves the integrity of the verified record while making the nature and direction of each change transparent to users and to the verifier.

One error in the FY25 workbook was identified during the FY26 review (the 0.65 t business travel understatement described in section 8.7). It is immaterial at both category and inventory level and has been disclosed rather than restated. Any implications of the FY26 methodology changes for CIAL's base year are assessed under the recalculation provisions of the Level 5 Requirements (section 4.4) and the materiality provisions of the Requirements for All Levels; the changes principally affect Scope 3 presentation and Scope 1 fugitive quantification, and regular annual emission factor updates do not trigger recalculation of historical inventories. CIAL's own emissions register has been aligned to the top-up refrigerant basis, so that the register and this inventory carry the same treatment into future years.