



HEATHROW AIRPORT LIMITED - GREENHOUSE GAS (GHG)

EMISSIONS PRINCIPLES AND METHODOLOGIES 2024



Heathrow

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1. INTRODUCTION

1.1. Context

The purpose of this document is to explain the approach taken by Heathrow Airport Limited (HAL) in collating and reporting our selected greenhouse gas emissions information, published in our Annual Report 2024 ('ARA') and Heathrow's Sustainability Report 2024. The greenhouse gas emissions information includes reporting of the following metrics subject to independent limited assurance procedures:

- Total scope 1 greenhouse gas emissions (tCO₂e).
- Total scope 2 location-based greenhouse gas emissions (tCO₂e).
- Total scope 2 market-based greenhouse gas emissions (tCO₂e).
- Total scope 3 greenhouse gas emissions (tCO₂e).

We report in accordance with the following relevant guidance:

- The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard.¹
- ISO 14064-1, Specification with Guidance at the Organisation Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.²
- Airport Carbon Accreditation (ACA) Standard, Level 4+.³

1.2. Reporting Boundary

The greenhouse gas emissions metrics cover the activities of HAL, which owns and operates Heathrow Airport,⁴ in the reporting year commencing 1st January 2024 and ending 31st December 2024. Scope 1 and 2 reporting is based on operations over which HAL has operational control,⁵ described in further detail below. In addition to operations at Heathrow Airport, this includes:

- The Business Support Centre (BSC), in Glasgow, where a number of HAL employees are based.
- The 'Pod' Test Track, in Cardiff, which was used as a testing facility. The site was cleared and decommissioned in November 2024⁶.

¹ Available at: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

² Available at: <https://www.iso.org/standard/66453.html>

³ Available at: <https://www.airportcarbonaccreditation.org/>

⁴ It should be noted that this excludes the activities of Heathrow Express Operating Company Limited (Hex Opco) as it is not owned by HAL. Please see our ARA for further information on our organisational structure.

⁵ As defined in the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard.

⁶ The emissions in 2024 are those associated with the demolition and clearance works.

In line with the Greenhouse Gas Protocol¹ and ACA Standards³ for airports, we report emissions under three scopes:

- **Scope 1:** Direct greenhouse gas emissions under our direct control. This includes:
 - Utilities fuel consumption for all owned or operated activities, includes natural gas (airport and BSC consumption) and biomass used to heat and provide power as well as diesel for emergency generators.
 - Liquefied petroleum gas (LPG) for fire training.
 - Fuel used in operational vehicles and equipment owned or operated by HAL (i.e. vehicles leased by HAL).
 - Refrigerant losses for HAL managed air-conditioning units onsite at Heathrow Airport.
 - De-icer applied by HAL to airfield surfaces.
- **Scope 2:** Indirect greenhouse gas emissions from grid electricity consumption. This includes all grid electricity consumed by all owned and operated activities onsite at Heathrow Airport, and offsite. Any use which relates to third parties, not within HAL's operational control is sub-metered and included within scope 3.
- **Scope 3:** Other indirect greenhouse gas emissions from activities in relation to our operations but from sources that we do not own or control. These include:⁷
 - Category 1: Purchased goods and services:
 - Water consumption at Heathrow Airport.
 - Fuel used for non-road construction vehicles at the Heathrow Airport.
 - Category 1: Purchased goods and services and Category 2: Capital goods:
 - Supply chain including all HAL purchased goods and services not already included in other categories.
 - Category 3: Fuel- and energy-related activities: Well-to-tank (WTT) and transmission and distribution (T&D) emissions for all relevant scope 1 and 2 emissions.
 - Category 5: Waste generated in operations: Waste (operational and construction) and wastewater at Heathrow Airport.
 - Category 6: Business travel: Business travel from HAL employees.
 - Category 7: Employee commuting and home office:
 - Colleague surface access for all Team Heathrow (includes HAL employees and all employees that operate at the airport) commuting to Heathrow Airport.
 - Category 11: Use of sold products:
 - Passenger surface access journeys made to and from Heathrow Airport.
 - De-icer applied by airlines and ground handlers to aircraft.
 - Fuel in operational vehicles and equipment owned or operated by third parties.
 - Emissions from aircraft in the landing and take-off (LTO) cycle for arrival and departure flights at Heathrow Airport below 3,000 ft. This includes auxiliary power unit (APU) emissions.
 - Cruise emissions from all departure flights at Heathrow Airport.⁸
 - Category 12: End-of-life treatment of sold products: Waste disposal and fuel consumption associated with the decommissioning of the Cardiff Pod Test Track.
 - Category 13: Downstream leased assets:

⁷ We note that category 11 currently excludes landside cargo and refrigerant losses for air-conditioning units managed by third parties at the airport. We are currently reviewing data availability to report on these. The following scope 3 categories are not relevant to HAL operations: Category 4: Upstream transportation and distribution, Category 8: Upstream leased assets, Category 9: Downstream transportation and distribution, Category 10: Processing of sold products, Category 14: Franchises, Category 15: Investments.

⁸ In line with ACA Standards, this follows the 'one-way' methodology and hence only includes departures.

- Grid electricity consumption by third parties at Heathrow Airport, including pre-conditioned air (PCA) and fixed electrical ground power (FEGP).
- Fuel consumption to provide heat to third parties at Heathrow Airport.⁹

We also report on additional metrics which are not subject to independent limited assurance separately from the scopes 1, 2 and 3, which go beyond the current requirements of the ACA Standards³:

- Outside of scope: The carbon dioxide (CO₂) impact of burning biomass and biofuels.
- WTT and T&D of scope 3 emissions.
- Savings from sustainable aviation fuel (SAF).

1.3. *Restatement Policy*

In line with the Greenhouse Gas Protocol¹, we are committed to ensure we recalculate our emissions (baselined in 2019) if any of the following cause a change of more than 5% (our significance threshold) to our total footprint (covering market-based scope 1, 2 and 3 combined):

- Structural changes in our organisation from the date of change (e.g. acquisition, divestments or mergers) that have a significant impact (singular or cumulative).
- Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact.
- Discovery of significant errors, or numerous cumulative errors that are significant.

⁹ Note that as HAL does not bill gas consumption directly to third parties, this only includes fuel consumption at the taxi feeder park at the airport.

2. METHODOLOGY

The overarching approach has been to obtain activity data and convert it to greenhouse gas emissions using emission factors associated with the relevant activity. Where data is unavailable, assumptions are made in line with relevant guidance, industry standards, and best practice. These are set out in the relevant sections of this document.

There are seven main greenhouse gases that contribute to climate change, as covered by the Kyoto Protocol: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). Different activities emit different gases and HAL reports on the particular Kyoto Protocol gases produced by HAL operations. The emission factors used enable us to report greenhouse gas emissions in terms of carbon dioxide equivalent (CO₂e).

The emission factors used are from the following sources:

- **The UK Government Conversion Factors for GHG reporting**¹⁰: published by the Department for Energy Security and Net Zero (DESNZ) and updated annually.
- **Airport Carbon and Emissions Reporting Tool (ACERT)**¹¹: Used to infer emissions associated with the use of de-icers.
- **Market-based reporting**: Renewable Energy Guarantees of Origin (REGO) certificates show that electricity supply is renewable, and thus have no greenhouse gas emissions associated when reporting under the market-based method. As per Greenhouse Gas Protocol Scope 2 Guidance¹², it is recommended that scope 2 emissions are reported using both a location and a market-based method.

¹⁰ Available at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024>

¹¹ Available at: <https://store.aci.aero/form/acert/>

¹² Available at: <https://ghgprotocol.org/scope-2-guidance>

2.1. Total scope 1 greenhouse gas emissions (tCO₂e)

2.1.1. Total scope 1 greenhouse gas emissions (tCO₂e)

Total scope 1 greenhouse gas emissions are the sum of the following scope 1 emissions sources:

- Fuel consumption utilities
- LPG for fire training
- Operational vehicles and equipment
- Refrigerant losses
- De-icer

2.1.2. Fuel Consumption Utilities

The calculation approach for scope 1 fuel consumption for utilities is detailed in **Table 1**.

Table 1: Scope 1 stationary sources – fuel consumption utilities

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
BSC Natural Gas	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by the UK Government Conversion Factor Natural gas (Gross CV).	None.	None.
Airport Natural Gas	kWh	Data supplied as kWh based on meter readings. Activity data is multiplied by the UK Government Conversion Factor Natural gas (Gross CV).		
Airport Biomass	tonnes	Data consisted of purchased tonnage of round timber (wood pellets) and wood chip based on supplier invoice records. Activity data is multiplied accordingly by the UK Government Conversion Factor Wood pellets and Wood chips.		
Airport Diesel	litres	Data supplied as litres of fuel used based on supplier invoice records. Activity data is multiplied by the UK Government Conversion Factor Diesel (average biofuel blend).		

2.1.3. LPG for Fire Training

The calculation approach for scope 1 LPG consumption for fire training is detailed in **Table 2**.

Table 2: Scope 1 stationary sources – LPG for fire training

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport LPG	litres	Due to the ongoing project to upgrade the fire training ground, no LPG was used during 2025.	None.	None.

2.1.4. Operational Vehicles and Equipment

The calculation approach for scope 1 operational vehicles and equipment fuel consumption is detailed in **Table 3**.

Table 3: Scope 1 mobile sources – operational vehicles and equipment

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Operational Vehicle and Equipment Diesel	litres	Data is supplied from the live pump tracking system as litres of fuel used per fuel type. To ensure accurate and streamlined reporting certain fuel data entries are excluded. These include bulk deliveries already counted in customer transactions, mobile tankers used at other airports during specific periods and default entries that represent remote pump activation. Activity data is multiplied by the appropriate UK Government Conversion Factor Diesel (average biofuel blend), Biodiesel hydrotreated vegetable oil (HVO) and Petrol (average biofuel blend).	None.	This excludes any fuel that is not handled by our main fuel provider, data availability is being reviewed to expand reporting.
Airport Operational Vehicle and Equipment HVO	litres			
Airport Operational Vehicle and Equipment Petrol	litres			

2.1.5. Refrigerant Losses

The calculation approach for scope 1 refrigerant losses is detailed in **Table 4**.

Table 4: Scope 1 process emissions – refrigerant losses

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Refrigerant (Large Chillers Units)	kg	Refrigerant leakage records (kg of refrigerant lost) provided for the large chiller units. Activity data is multiplied by the UK Government Conversion Factor for the relevant refrigerant e.g. R410A.	Raw data estimates refrigerant losses by subtracting refrigerant charge from refrigerant recovered to get the leakage.	This excludes the BSC for which data availability is being reviewed, though not considered a material omission. ¹³
Airport Refrigerant (Remaining assets)	kg	Refrigerant leakage has been estimated from the entire group of assets based on information held on refrigerant charge and type, with assumptions on annual leakage rate applied. Assumed leakage is multiplied by the UK Government Conversion Factor for the relevant refrigerant.	A list is provided with the total refrigerant quantity of the remaining units. A 5% and 30% leakage rate is assumed for 'Residential and Commercial A' and 'Medium and Large Commercial refrigeration' respectively. This is per the IPCC Good Practice Guidelines provided in the Refrigeration and Air-Conditioning Equipment GHG Protocol Tool ¹⁴ .	

¹³ The number of employees reported at year end 31 December 2023 for the BSC was 140, equivalent to 1.9% of employees at Heathrow Airport (7,317). This provides an indication of the size of the office facility relative to Heathrow Airport.

¹⁴ Available at: <https://ghgprotocol.org/calculation-tools-and-guidance>

2.1.6. De-icer

The calculation approach for scope 1 de-icer consumption is detailed in **Table 5**.

Table 5: Scope 1 process emissions – de-icer

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport De-icer	litres	Data supplied as total litres of de-icer generated from the on-board telematics system on HAL's spreading vehicles. De-icer is confirmed to be undiluted and glycol-based as per the product information provided. Activity data is multiplied by the ACERT emission factor for undiluted glycol.	None.	Excludes data from one unit during October to December due to a technical issue. Solid de-icer is excluded, HAL is reviewing data collection processes to report on this with the latest ACERT factors.

2.2. Total scope 2 greenhouse gas emissions (tCO₂e)

Total scope 2 emissions cover the indirect emissions from the consumption of purchased electricity. There are two reporting methods for calculating these emissions: market-based and location-based. Location-based refers to scope 2 greenhouse gas emissions associated with a specific geographic area i.e., the average from the UK electricity network. HAL purchases its electricity under a zero emissions contract that is fully backed by REGO certificates. This is reliant on the electricity suppliers fulfilling their contractual obligations under the terms of their renewable tariff to back all energy supplied to all their customers on such tariffs by REGOs. This means that under market-based reporting guidance, the scope 2 electricity emissions covered by REGOs are reported as zero emissions.

To account for scope 2 consumption; third party sub-metered consumption, including PCA and FEGP, is subtracted from the total grid electricity consumption value and included within scope 3.

2.2.1. Total scope 2 market-based greenhouse gas emissions (tCO₂e).

For market-based scope 2 reporting we apply the hierarchy of emission sources and scope 2 quality criteria in the Greenhouse Gas Protocol Scope 2 Guidance¹², reporting using the highest precision methodology based on our REGO-backed energy. The process to conclude the retirement of REGO certificates for the year ending 31 December 2024, will be completed in 2025.

The calculation approach for scope 2 grid electricity consumption (market-based) is detailed in **Table 6**.

Table 6: Scope 2 electricity – grid electricity consumption (market-based)

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Electricity (Market-based)	kWh	Data supplied as kWh based on meter readings, with third-party (scope 3) consumption subtracted from the total grid electricity consumption. Activity data is multiplied by a green electricity factor which is 0 kgCO ₂ e/Unit.	Estimates are used for recent months (September to December) rather than actuals to allow for time to invoice third parties. These monthly estimates are based on the actual metered 2024 total electricity consumption in terminal areas, which is then multiplied by the 2023 ratio (based on actual sub-metered data) of HAL to third-party consumption.	None.
BSC Electricity (Market-based)	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by a green electricity factor which is 0 kgCO ₂ e/Unit.	None.	None.

2.2.2. Total scope 2 location-based greenhouse gas emissions (tCO₂e).

The calculation approach for scope electricity consumption (location-based) is detailed in **Table 7**.

Table 7: Scope 2 electricity – grid electricity consumption (location-based)

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Electricity (Location-based)	kWh	Data supplied as kWh based on meter readings, with third-party (scope 3) consumption subtracted from the total grid electricity consumption. Activity data is multiplied by the UK Government Conversion Factor UK Electricity generated.	Estimates are used for recent months (September to December) rather than actuals to allow for time to invoice third parties. These monthly estimates are based on the actual metered 2024 total electricity consumption in terminal areas, which is then multiplied by the 2023 ratio (based on actual sub-metered data) of HAL to third-party consumption.	None.

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
BSC Electricity (Location-based)	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by the UK Government Conversion Factor UK Electricity generated.	None.	None.

2.3. Total scope 3 greenhouse gas emissions (tCO₂e)

2.3.1. Total scope 3 greenhouse gas emissions (tCO₂e).

Total scope 3 greenhouse gas emissions are the sum of the following scope 3 emissions sources:

- Water consumption
- Non-road construction vehicles
- Supply chain
- WTT/T&D of scope 1 and 2 (market based)
- Waste
- Wastewater
- Business travel
- Colleague surface access
- Passenger surface access
- De-icing – aircraft
- Operational vehicles and equipment
- Aircraft in the LTO cycle
- Cruise emissions from all departure flights
- Decommissioning of the Cardiff Pod Test Track
- Third-party grid electricity consumption (market based)
- Fuel consumption utilities

Category 1: Purchased Goods and Services

2.3.2. Water Consumption

The calculation approach for scope 3 water consumption is detailed in **Table 8**.

Table 8: Scope 3 Category 1 – water consumption

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
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Water Consumption	cubic meters	Data supplied as cubic meters of water used based on meter readings and supplier invoice records. Activity data is multiplied by the UK Government Conversion Factor Water supply.	None.	This excludes the BSC for which data availability is being reviewed, though not considered a material omission. ¹³
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2.3.3. Non-road Construction Vehicles

The calculation approach for scope 3 non-road construction vehicles fuel consumption is detailed in **Table 9**.

Table 9: Scope 3 Category 1 – non-road construction vehicles

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Non-road Construction Vehicles Diesel	litres	Data was provided as total litres of diesel used per construction company. Activity data is multiplied by the UK Government Conversion Factor Diesel (average biofuel blend).	None.	This excludes any fuel that is not handled by our main fuel provider, data availability is being reviewed to expand reporting.
Non-road Construction Vehicles HVO	litres	Data was provided as total litres of HVO used per construction company. Activity data is multiplied by the UK Government Conversion Factor Biodiesel HVO.		

Category 1: Purchased Goods and Services and Category 2: Capital Goods

2.3.4. Supply Chain

The calculation approach for scope 3 supply chain emissions is detailed in **Table 10**.

Table 10: Scope 3 Category 1 and 2 – supply chain

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Supply Chain	£ GBP	Supply chain spend has been used to derive the emissions from the supply chain. This is based on all purchase invoices in the reporting period based on the	None.	None.

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
		invoice date. The invoice amount is exclusive of VAT. Adjustments were made to remove categories already accounted for in scopes 1, 2 and 3 (electricity, gas, vehicle fuel and operational waste). Spend deemed not to have associated emissions is also removed, including vehicle taxes and licences, other taxation, insurance premiums, local authority fees, rent and service charge, and shareholder payments. Carbon intensity factors, developed bespoke for HAL in 2019 and adjusted for inflation, were applied to relevant spend categories to calculate resulting emissions. New carbon intensity factors were commissioned in 2024 and are currently undergoing review to inform future emissions accounting.		

Category 3: Fuel-and Energy-related Activities

2.3.5. WTT/T&D of Scope 1 and 2

The calculation approach for scope 3 WTT (well-to-tank) and T&D (transmission and distribution) of scope 1 and 2 sources is in **Table 11**. Location-based electricity includes all WTT/T&D and WTT T&D, while market-based electricity reporting only includes T&D and WTT T&D as there are no WTT emission associated with the zero emission electricity procured. This metric is for market-based reporting, with location-based information also reported here for completeness. The same data sources as scope 1 and 2 reporting are used with the different emissions factors applied.

Table 11: Scope 3 Category 3 – WTT/T&D of scope 1 and 2

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
BSC Natural Gas WTT	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by the UK Government Conversion Factor WTT Natural gas (Gross CV).	See Table 1 .	See Table 1 .
Airport Natural Gas WTT	kWh	Data supplied as kWh based on meter readings. Activity data is multiplied by the UK Government Conversion Factor WTT Natural gas (Gross CV).	See Table 1 .	See Table 1 .

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Biomass WTT	tonnes	Data consisted of purchased tonnage of round timber (wood pellets) and wood chips based on supplier invoice records. Activity data is multiplied accordingly by the UK Government Conversion Factor WTT Wood pellets and WTT Wood chips.	See Table 1.	See Table 1.
Airport Diesel WTT	litres	Data supplied as litres of fuel used based on supplier invoice records. Activity data is multiplied by the UK Government Conversion Factor WTT Diesel (average biofuel blend).	See Table 1.	See Table 1.
Airport LPG WTT	litres	Due to the ongoing project to upgrade HAL's fire training ground, no LPG was used during 2025.	See Table 2.	See Table 2.
Airport Operational Vehicle and Equipment Diesel WTT	litres	Data is supplied from the live pump tracking system as litres of fuel used per fuel type. Activity data is multiplied by the UK Government Conversion Factor WTT Diesel (average biofuel blend).	See Table 3.	See Table 3.
Airport Operational Vehicle and Equipment HVO WTT	litres	Data is supplied from the live pump tracking system as litres of fuel used per fuel type. Activity data is multiplied by the UK Government Conversion Factor WTT Biodiesel HVO.	See Table 3.	See Table 3.
Airport Operational Vehicle and Equipment Petrol	litres	Data is supplied from the live pump tracking system as litres of fuel used per fuel type. Activity data is multiplied by the UK Government Conversion Factor Petrol (average biofuel blend).	See Table 3.	See Table 3.
Airport Electricity (Market-based) T&D, WTT T&D	kWh	Data supplied as kWh based on meter readings, with third-party (scope 3) consumption subtracted from the total grid electricity consumption. Activity data is multiplied by the UK Government Conversion Factor UK T&D, WTT T&D.	See Table 6.	See Table 6.
BSC Electricity (Market-based) T&D, WTT T&D	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by the UK Government Conversion Factor UK T&D, WTT T&D.	See Table 6.	See Table 6.

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Electricity (Location-based) WTT, T&D, WTT T&D	kWh	Data supplied as kWh based on meter readings, with third-party (scope 3) consumption subtracted from the total grid electricity consumption. Activity data is multiplied by the UK Government Conversion Factor UK Electricity generated WTT, T&D, WTT T&D.	See Table 7.	See Table 7.
BSC Electricity (Location-based) WTT, T&D, WTT T&D	kWh	Data supplied as kWh based on invoice records. Activity data is multiplied by the UK Government Conversion Factor UK Electricity generated WTT, T&D, WTT T&D.	See Table 7.	See Table 7.

Category 5: Waste Generated in Operations

2.3.6. Waste and Wastewater

The calculation approach for scope 3 waste and wastewater is in **Table 12.**

Table 12: Scope 3 Category 5 – waste and wastewater

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Operational Waste	tonnes	Waste data is based on waste transfer notes and provided in tonnes of waste, by waste type and disposal destination. Activity data is multiplied by the UK Government Conversion Factor for the relevant waste type and treatment method.	When the exact emission factor is not available to match the waste type and treatment an appropriate proxy emission factor is used.	Excludes used cooking oil which is handled via a separate waste stream. Data availability is being reviewed to expand reporting.
Construction Waste	cubic meters	Waste data is based on waste transfer notes and provided in volume of waste, by waste type and disposal destination. Data is converted to tonnes based on total weight per waste type split between the percentage volume to each disposal destination. Activity data is multiplied by the UK Government Conversion Factor for the relevant waste type and treatment method.	When the exact emission factor is not available to match the waste type and treatment an appropriate proxy emission factor is used.	This excludes any construction waste not handled by our main construction waste manager; data availability is being reviewed to expand this.

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Wastewater	cubic meters	Data supplied as cubic meters of water used based on supplier invoice records and waste transfer notes. Activity data is multiplied by the UK Government Conversion Factor Water treatment.	None.	None.

Category 6: Business Travel

2.3.7. Business Travel

The calculation approach for scope 3 business travel is in **Table 13**.

Table 13: Scope 3 Category 6 – business travel

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Business Travel Pre-booked	various	HAL's pre-booking system for business travel includes hotel stays (room per night), train travel (km), flights (passenger.km) and day travelcards purchased (quantity). Activity data is multiplied by the UK Government Conversion Factor for the relevant mode of transport.	Hotel stays: when emission factors are not available for the specific country a proxy country is selected by geographical proximity. Flights: the long-haul emission factor is used for both long-haul (to/from the UK) and international (not to/from the UK) flights as no distinction is made in the categorisation of data. Where journeys include legs of travel in multiple classes, the highest class is used for the full journey as a worst-case. Travelcards: number of travelcards is converted to passenger.km using the average daily distance travelled in London per person in proportion to the total passenger.km by modes of transport¹⁵.	None.
Business Travel Expenses	£ GBP	Expense data includes hire car fuel (spend), taxi (spend), public transport (spend). Assumptions are applied to convert spend to activity data which is multiplied by the UK	Hire car fuel: spend is converted to litres using the average road fuel price for premium ULSP per litre in 2023¹⁶. Taxi: spend is converted to distance using the average miles travelled per fare¹⁷.	

¹⁵ Available at: <https://content.tfl.gov.uk/travel-in-london-2023-trends-in-public-transport-demand-and-operational-performance-acc.pdf>

¹⁶ Available at: <https://www.gov.uk/government/statistical-data-sets/oil-and-petroleum-products-monthly-statistics>

¹⁷ Available at: <https://tfl.gov.uk/modes/taxis-and-minicabs/taxi-fares?cid=taxifares>

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
		Government Conversion Factor for the relevant mode of transport.	Public transport: spend by mode of transport is converted to passenger km using the passenger km per pound derived from Transport for London passenger income in proportion to billion passenger km ¹⁵ .	
Business Travel Mileage	km	Mileage data includes car travel (km). Activity data is multiplied by the UK Government Conversion Factor Average Car unknown fuel.	None.	

Category 7: Employee Commuting and Home Office

2.3.8. Colleague Surface Access

The calculation approach for scope 3 colleague surface access is in **Table 14**.

Table 14: Scope 3 Category 7 – colleague surface access

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Colleague Surface Access	various	Colleague travel data is sourced from the 2024 Team Heathrow travel survey which determined the typical number of working days, the start points and modes of travel. To ensure the survey results are representative of each company, job roles within them, and different working locations at Heathrow Airport, a relative weighting was applied to each response. Data is then scaled based on the number of active airport pass holders. The distances from each start point to Heathrow Airport are determined using the Google Maps Distance Matrix API ¹⁸ and an air miles calculator ¹⁹ . A two-way journey is considered for all modes.	Only qualified survey responses with complete information are included and cleansing is undertaken to rationalise data. Private car journeys are only accounted for where the employee is the driver. Adjustments have been made to data based on London locations: For underground when the origin location is not London, the National Rail emissions factor is applied. Responses are scaled to the full year taking into account leave (5 weeks) and bank holidays (1.6 weeks).	This excludes the BSC for which data availability is being reviewed, though not considered a material omission. ¹³ Trips by air travel are excluded, and their inclusion is under review to first understand potential double counting of aircraft LTO and cruise emissions.

¹⁸ Available at: <https://developers.google.com/maps/documentation/distance-matrix/overview>

¹⁹ Available at: <https://www.airmilescalculator.com/>

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
		Activity data is multiplied by the UK Government Conversion Factor for the relevant mode of transport. Private car journeys account for the vehicle fuel type.		Homeworking of HAL employees is excluded, this is an optional reporting category under the ACA and GHG Protocol.

Category 11: Use of Sold Products

2.3.9. Passenger Surface Access

The calculation approach for scope 3 passenger surface access is in **Table 15**.

Table 15: Scope 3 Category 11 – passenger surface access

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Passenger Surface Access	various	Data is collected through interviews carried out throughout the year, in 2024 reaching circa 20,000 passengers. These are weighted by the total number of departing passengers to give an estimate of the total number of passengers by start point and mode across the year. The distances from each start point to Heathrow are determined using the Google Maps Distance Matrix API ¹⁸ . A two-way journey is considered for all modes. Activity data is multiplied by the UK Government Conversion Factor for the relevant mode of transport.	Adjustments have been made to data based on London locations: For bus travel when the location is London the Local London Bus emissions factor is applied. For coach and bus travel when not in London, the Coach emissions factor is applied. For underground when the origin location is not London, the National Rail emissions factor is applied. For car travel we use the average car unknown fuel emission factor from the UK Government which accounts for the average fleet nationally.	None.

2.3.10. De-icing Aircraft

The calculation approach for scope 3 aircraft de-icing is in **Table 16**.

Table 16: Scope 3 Category 11 – de-icing aircraft

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Aircraft De-icing	litres	Data supplied by ground handlers as total litres of de-icer (type 1) and anti-icer (type 4) used. Values reported are as sprayed onto the aircraft including dilution. Type 1 is diluted by 35% while type 4 is sprayed undiluted, the pure glycol amount is calculated based on these dilutions. Activity data is multiplied by the ACERT emission factor for undiluted glycol.	None.	None.

2.3.11. Third Party Operational Vehicles and Equipment

The calculation approach for scope 3 operational vehicles and equipment is in **Table 17**.

Table 17: Scope 3 Category 11 – operational vehicles and equipment

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Airport Operational Vehicle and Equipment Diesel	litres	Data is supplied from the live pump tracking system as litres of fuel used per fuel type. This is filtered to show third-party vehicles which are identified based on the vehicle data chips which are in all vehicles using the fuelling stations. To ensure accurate and streamlined reporting certain fuel data entries are excluded. These include bulk deliveries already counted in customer transactions, mobile tankers used at other airports during specific periods and default entries that represent remote pump activation. Activity data is multiplied by the appropriate UK Government Conversion Factor Diesel (average biofuel blend), Biodiesel HVO and Petrol (average biofuel blend).	None.	This excludes any fuel that is not handled by our main fuel provider, data availability is being reviewed to expand reporting.
Airport Operational Vehicle and Equipment HVO	litres			
Airport Operational Vehicle and Equipment Petrol	litres			

2.3.12. Aircraft in the LTO Cycle and Cruise Emissions from all Departure Flights

The calculation approach for scope 3 aircraft in the LTO cycle and cruise emission from all departure flights is in **Table 18**.

Table 18: Scope 3 Category 11 – aircraft in the LTO cycle and cruise emissions from all departure flights

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions												
Aircraft in the Landing and Take-Off (LTO) Cycle	Gg	The calculation methodology follows guidance on aircraft emissions calculations: International Civil Aviation Organization (ICAO) Airport Air Quality Manual (Doc 9889).²⁰ LTO cycle emissions account for fuel burned during all aircraft ground movements and air movements up to 3,000 ft altitude (above the ground level of the airport). There are two primary inputs used to calculate fuel consumption in the LTO cycle: time in mode and fuel flow rate. These have been outlined in further detail below. Time in mode Radar data is used to determine the time (in seconds) spent by each aircraft at the following phases of operation. Bounds are placed on the times in mode to limit the impact of any non-standard operations: <table><tr><th>Phase</th><th>Detail</th><th>Min</th><th>Max</th></tr><tr><td>Approach</td><td>From an altitude of 3,000 feet until the aircraft lands on the runway.</td><td>150</td><td>400</td></tr><tr><td>Taxi</td><td>From the moment the aircraft leaves the stand and begins taxiing on the runway until it lifts off the ground</td><td>0</td><td>1200*</td></tr></table>	Phase	Detail	Min	Max	Approach	From an altitude of 3,000 feet until the aircraft lands on the runway.	150	400	Taxi	From the moment the aircraft leaves the stand and begins taxiing on the runway until it lifts off the ground	0	1200*	The approach assumes that all aircraft engines are operating and that there is movement the entire duration of the LTO cycle. The assumed standard temperature and pressure is 15 degrees Celsius and 1013 hectopascals respectively. As APU emissions are not captured through this approach, an 11% uplift is applied to LTO emissions to account for this. This percentage uplift was determined using outputs from Air Quality Models which rely on APU compliance audits. The APU running times are derived from observations of APU running times reported annually. This data has been analysed to extract average running times on arrival and on departure for narrow and wide-bodied aircraft types.	If the aircraft and engine type is unable to be mapped to the ICAO Emissions Databank, these will be excluded. This is not considered to be a material omission and equates to 0.2% of flights. Aircraft engine testing is excluded, though this is not considered a material omission with alternative models suggesting that engine testing account for 0.1% of LTO emissions. We are reviewing data availability to improve this. The use of the UK Government Conversion factor implies that we do not account for the benefits of the Heathrow SAF Incentive scheme within this category of emissions, with these instead calculated in the
Phase	Detail	Min	Max													
Approach	From an altitude of 3,000 feet until the aircraft lands on the runway.	150	400													
Taxi	From the moment the aircraft leaves the stand and begins taxiing on the runway until it lifts off the ground	0	1200*													

²⁰ Available at: https://www.icao.int/publications/documents/9889_cons_en.pdf

Emission Source	Units	Methodology				Significant Estimations and Assumptions	Exclusions
		Take-off	From the moment the aircraft takes off until it reaches an altitude of 1,150 feet.	20	125	We are reviewing data availability to improve this.	'Separately from the Scopes' emissions.
		Climb	From an altitude of 1,150 feet to 3,000 feet.	20	125		
		* If the duration exceeds 1,200 seconds, a default taxi time will be used which is configured in the system and varies based on the type of aircraft. Fuel flow rate The fuel flow rate is the amount of fuel an aircraft burns in each phase of operation. The ICAO Aircraft Engine Emissions Databank²¹ contains fuel flow rates for each aircraft and associated engine type combinations in each phase of operation. Using this database, every aircraft is mapped to identify the appropriate fuel flow rate for each time in mode. The fuel flow rate is then adjusted for temperature and weather. This is sourced from METeorological Aerodrome Reports (METAR) on an hourly basis. An equation is used to adjust the fuel flow rate if the temperature and pressure deviates from the standard assumption. Calculation performed <i>Fuel burned = Fuel flow rate x Time in mode</i> The fuel burn is calculated by a third party that applies the methodology described above. The resulting fuel burn is multiplied by the appropriate UK Government Conversion Factor for Aviation Turbine Fuel.					

²¹ Available at: <https://www.easa.europa.eu/en/domains/environment/icao-aircraft-engine-emissions-databank>

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Cruise Emission from Departure Flights	Gg	The calculation methodology follows guidance on aircraft emissions calculations: European Environment Agency (EMEP/EEA) air pollutant emission inventory guidebook 2023.²² Cruise emissions account for the fuel burnt during flight above 3,000 feet from the origin to destination airport. There are two primary inputs used to calculate the cruise emissions from departure flights: great circle distance and the fuel flow rate. These have been outlined in further detail below. Great circle distance Radar data is used to determine when an aircraft is at 3,000 feet, at which point the remaining distance to the destination is inferred using the great circle distance. This takes the shortest distance to the destination airport, in meters. This approach does not consider the actual flight path taken. If the great circle distance is between 200km and 4,000km, the input into the calculation is uplift by 5%. If the great circle distance is greater than 4,000km, the input into the calculation is uplift by 6%. Fuel flow rate The fuel flow rate is the is at which fuel is burned throughout the duration of flight, from above 3,000 ft. The EuroControl FEIS database contains fuel flow rates for each engine and aircraft type. Using the 2021 EuroControl FEIS database, every aircraft is mapped to identify the appropriate fuel flow rate. The fuel flow rate is not weather adjusted as upper troposphere effects are accounted for already in the EuroControl FEIS database. If the flight time exceeds the duration available in the EuroControl FEIS database, the maximum fuel flow rate will be used and an	Within the third-party provider's system, flight distances are assumed to be the great circle distance between Heathrow Airport and the destination airport. In the case that the aircraft or engine type is not included in this database, a fuel flow rate is selected based on professional judgement, with an 'adjustment' applied to existing rates within the database.	The use of the UK Government Conversion factor implies that we do not account for the benefits of the Heathrow SAF Incentive scheme within this category of emissions, with these instead calculated in the 'Separately from the Scopes' emissions.

²² Available at: <https://www.eea.europa.eu/publications/emep-eea-guidebook-2023>

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
		uplift applied to account for the addition time flown beyond the maximum duration in the EuroControl FEIS database. Calculation performed <i>Fuel burned = Fuel flow rate x Total great circle distance</i> The fuel burn is calculated by a third party that applies the methodology described above. The resulting fuel burn is multiplied by the appropriate UK Government Conversion Factor for Aviation Turbine Fuel.		

Category 12: End-of-life treatment of sold products

2.3.13. Decommissioning of Cardiff Pod Test Track

The calculation approach for scope 3 decommissioning of Cardiff Pod Test Track is detailed in **Table 19**.

Table 19: Scope 3 Category 12 – decommissioning of Cardiff Pod Test Track

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Non-road Construction Vehicles Diesel	litres	Data was provided as total litres of diesel used. Activity data is multiplied by the UK Government Conversion Factor Diesel (average biofuel blend).	None.	None.
Construction Waste	tonnes	Waste data is based on waste transfer notes and provided in tonnage of waste, by waste type and disposal destination. Activity data is multiplied by the UK Government Conversion Factor for the relevant waste type and treatment method.		

Category 13: Downstream Leased Assets

2.3.14. Third Party Grid Electricity (Market-based)

For market-based scope 3 electricity reporting we apply the hierarchy of emission sources and scope 2 quality criteria in the Greenhouse Gas Protocol Scope 2 Guidance¹², reporting using the highest precision methodology based on our REGO-backed energy contract which ensures the electricity supply is fully renewable, and thus reported as zero emissions. The process to conclude the retirement of REGO certificates for the year ending 31 December 2024, will be completed in 2025. Given that the third-party consumption is sub-metered from the airport grid, and HAL have control over procurement and application of the REGO backed contract, market-based reporting is appropriately used in the assured metric for scope 3.

The calculation approach for scope 3 market-based third party grid electricity is in **Table 20**.

Table 20: Scope 3 Category 13 – third party grid electricity (market-based)

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Third Party Grid Electricity (Market-based)	kWh	Data supplied as kWh based on sub-meter readings and invoice records. Activity data is multiplied by a green electricity factor which is 0 kgCO ₂ e/Unit.	Estimates are used for recent months (September to December) rather than actuals to allow for time to invoice third parties. These monthly estimates are based on the actual metered 2024 total electricity consumption in terminal areas, which is then multiplied by the 2023 ratio (based on actual sub-metered data) of HAL to third-party consumption	None.

2.3.15. Third Party Grid Electricity (Location-based)

This metric is for market-based, location-based information is reported for completeness. The calculation approach is in **Table 21**.

Table 21: Scope 3 Category 13 – third party grid electricity (location-based)

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Third Party Grid Electricity (Location-based)	kWh	Data supplied as kWh based on meter readings and invoice records. Activity data is multiplied by the UK Government Conversion Factor UK Electricity generated.	Estimates are used for recent months (September to December) rather than actuals to allow for time to invoice third parties. These monthly estimates are based on the actual metered 2024 total electricity consumption in terminal areas, which is then multiplied by the 2023 ratio (based on actual sub-metered data) of HAL to third-party consumption	None.

2.3.16. Fuel Consumption Utilities

The calculation approach for scope 3 third party fuel consumption utilities is in **Table 22**.

Table 22: Scope 3 Category 13 – fuel consumption utilities

Emission Source	Units	Methodology	Significant Estimations and Assumptions	Exclusions
Third Party Natural Gas	kWh	Heathrow Taxi Feeder Park/Gas at Cardinal Point, Newall Road falls under third party consumption as HAL does not have operational control. Data supplied as kWh based on sub-meter readings. Activity data is multiplied by the UK Government Conversion Factor Natural gas (Gross CV).	None.	None.

2.4. Separately from the Scopes 1, 2 and 3 GHG Emissions

We also report on additional metrics which are not subject to independent limited assurance as separately from the scopes 1, 2 and 3 greenhouse gas emissions as detailed in **Table 23**. These additional metrics go beyond the current requirements of the ACA Standards.

Table 23: Methodology for additional unassured emission metrics reported

Emission Source	Description	Methodology
Outside of scope (biofuels)	As per UK Government GHG Conversion Factors for Company Reporting guidance, outside of scope factors should be used to account for the direct CO ₂ impact of burning biomass and biofuels. The emissions are labelled 'outside of scope' because the scope 1 impact of these fuels has been determined to be a net '0' (since the fuel source itself absorbs an equivalent amount of CO ₂ during the growth phase as the amount of CO ₂ released through combustion).	The calculations are based on the same data sources as detailed in the above sections for all relevant scopes 1, 2 and 3 emission sources, where fuels have biofuel content. This includes outside of scopes emissions for the following sources: - Fuel consumption utilities, - Operational vehicles and equipment, - Grid electricity consumption (location-based), - Non-road construction vehicles (including decommissioning of the Cardiff Pod Test Track), - Third party operational vehicles and equipment, - Third party grid electricity (location-based). Any significant estimations and assumptions, and exclusions are noted in those sections above for each individual emission source. Activity data is multiplied by the corresponding UK Government Conversion Factor for outside of scopes reporting for combustion of biomass and biofuels.
WTT and T&D of scope 3	WTT emissions are the emissions associated with extracting, processing, and transporting fuel before application. This goes beyond the reporting requirement of the ACA Standard. However, we deem it important to acknowledge the lifecycle impacts of all fuels used at the airport. The WTT of all scope 3 emission sources are therefore reported as 'separately from scopes'. Reporting also includes T&D emissions for third party grid electricity consumption.	The calculations are based on the same data sources as detailed in the above sections for all relevant scope 3 emission sources. This includes WTT emissions for the following: - Colleague surface access, - Passenger surface access, - Non-road construction vehicles (including decommissioning of the Cardiff Pod Test Track), - Business travel (not relevant to hotel stays), - Third party operational vehicles and equipment, - Aircraft LTO and cruise emissions, - Third party grid electricity (market-based) – T&D losses and WTT of T&D only, - Third party grid electricity (location-based) – T&D losses and WTT of generation and T&D, - Fuel consumption utilities. Any significant estimations and assumptions, and exclusions are noted in those sections above for each emission source. Activity data is multiplied by the corresponding UK Government Conversion Factor for WTT / T&D emissions reporting.

Emission Source	Description	Methodology
Savings from Sustainable Aviation Fuel (SAF) on lifecycle aircraft emissions	SAF has been used at Heathrow Airport since 2022, as part of our SAF Incentive Scheme. However, the benefits of SAF are associated with the extraction and processing (i.e. the Well-To-Tank) of the fuel. As a result, as we don't currently disclose the WTT emissions associated with the jet fuel of aircraft at Heathrow within our reporting boundary, we disclose the savings associated with the use of SAF over regular jet fuel as separately from scopes. There is emerging guidance from professional bodies and standard setters on how to account for SAF and we are reviewing our reporting methodology in line with this.	Airlines provided Product Transfer Documents (PTDs) from their fuel suppliers, which include information on the volume of SAF uplifted at Heathrow Airport and its associated lifecycle emissions saving in comparison to fossil jet fuel. The calculations of savings from SAF are based on these savings against the UK Government Conversion Factor for Aviation Turbine Fuel and its associated fuel properties for conversions between volume (litres/m³) and tonnage. The basic equation is as follows: <i>Savings from SAF = volume of SAF uplifted x lifecycle emissions factor for Aviation Turbine Fuel x lifecycle emissions savings from SAF</i> For 2022 and 2023, as part of efforts to remove barriers to SAF usage and in an effort to mature an evolving data source we deemed it sufficient that airlines demonstrated delivery to a pipeline with low likelihood of disserving other airports. From 2024 onwards, only evidence which explicitly states Heathrow Airport as the delivery location is deemed sufficient. Conversions between volumes and weights of SAF were carried out following annually updated values from the UK Government Conversion Factor for Aviation Turbine Fuel. We will be reviewing this approach as further guidance emerges.